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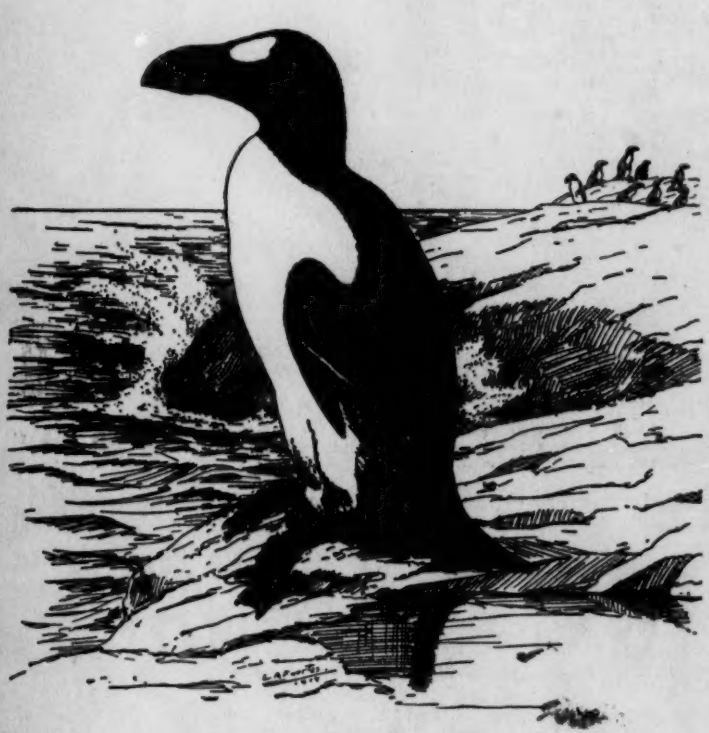

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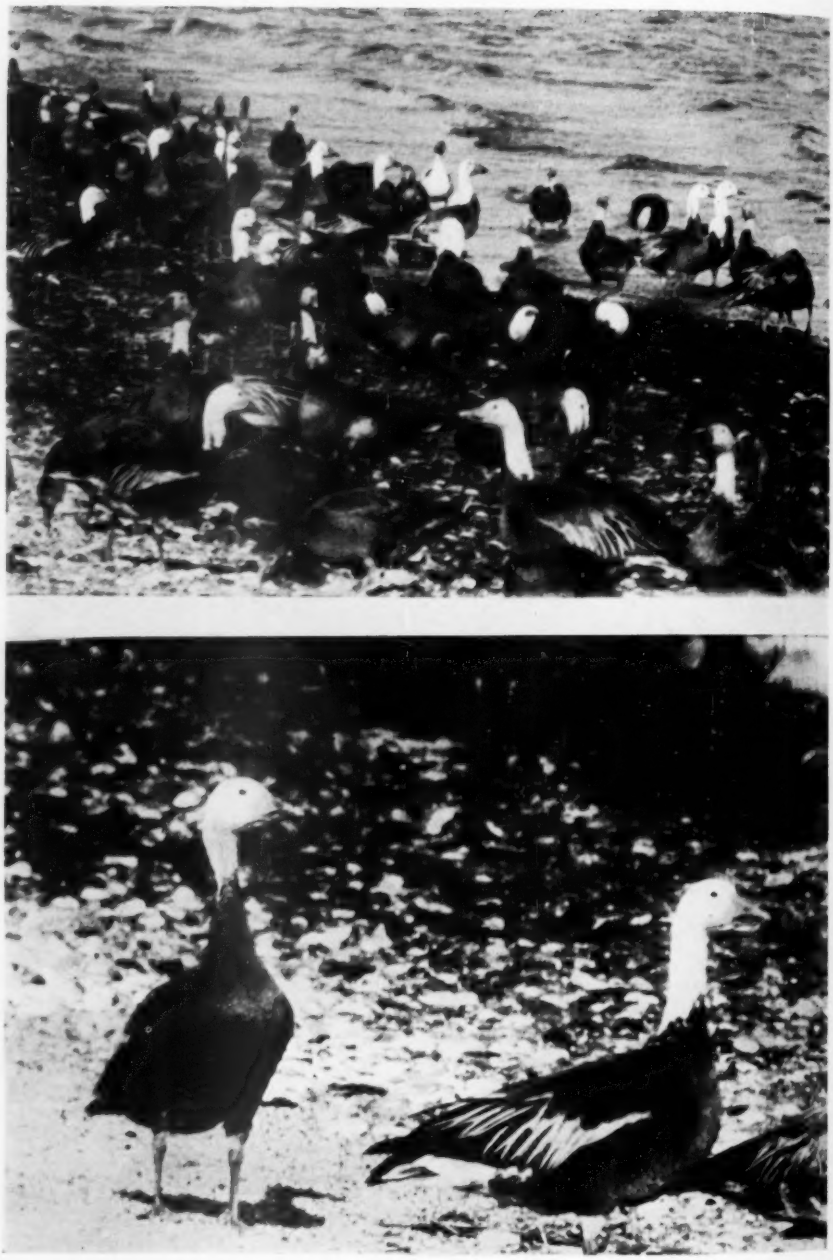

Photos by E. A. McIlhenny.

BLUE GEESE ON GRAVEL BANK SOUTH SIDE OF VERMILLION BAY, LA.

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THE BLUE GOOSE IN ITS WINTER HOME.

BY E. A. MCILHENNY.

(*Plates IX–XI.*)

FOREWORD.

IN this article I shall give some intimate observations on the winter life of the Blue Geese as observed by me during more than fifty years of living among them on Avery Island, Louisiana, a property that has belonged to my family for more than a hundred years.

Avery Island is a range of hills rising more than one hundred and fifty feet above the salt marsh four miles north of the center of Vermilion Bay and a little west of the center of the coast line of Louisiana. The marshes bordering the Gulf of Mexico and its salt water bays, for a distance of thirty miles east of Avery Island and sixty miles west, constitute the winter home of at least seven-tenths of all the Blue Geese.

It is in this territory of Blue Goose winter concentration that I have lived. Fifty-two years ago on March 29, my father gave me a shot gun, and on that day I wing-tipped a Blue Goose, and kept it for several years as a pet. Since that date I have always had Blue Geese in captivity; sometimes as many as a hundred at a time so that I know them intimately both as wild and as domesticated birds.

Fall Migration.

Many times I have seen small flocks of Blue Geese on the Gulf coast in the last week of August, and this early arrival is simultaneous with the first southern flight of Pintail and Gadwall ducks.

The ducks stay but the geese do not. They seem to be advance scouts come to look their winter range over, and go north again after one or two days rest in the ponds back of the beach ridge. The next showing of Blue Geese is in late September when, if conditions are right, a considerable number may arrive and stay on some newly burned over areas of *Spartina patens* or *Scirpus americanus* where they find food and water to their liking. The birds arriving in September also should be looked upon as stragglers; some of them remain for the winter but many of them drift back north. The principal southern flight arrives during October and usually comes in two waves; the first, early in October, is generally only a small one, and seems to be the advance guard to locate the best early feeding grounds. These early October birds are restless and move from place to place without apparent reason and often a considerable proportion of them will go north again. The heavy migration occurs during late October and early November. These late birds come in an unbroken wave which usually lasts from a day and night, to three days and nights, and during that time, flocks of Blue Geese are constantly in sight and hearing of my house.

These flocks are small, numbering usually from ten to fifty or occasionally more than a hundred. They fly without fixed formation, but generally in the V, which is constantly changing due to the end birds closing into the hollow of the V or flattening it out until it is almost a straight line. They all fly at this season at a height of eight hundred to fifteen hundred feet, and it is easy to distinguish the Blue Geese, both young and adult, from the Lesser Snow Geese (*Chen hyperborea hyperborea*) which are mixed with them.

Some years there are considerably more Snow Geese in the flocks than in others, and sometimes many Snow Geese arrive and then go west along the Gulf coast to their real winter quarters. My judgement is, that on an average there is about one Lesser Snow Goose to every sixty-five Blue Geese in the area occupied by these birds at the mouth of the Mississippi River and in the Marsh Island to Calcasieu River territory. West of the Caceasan River the winter proportion of Snow Geese increases rapidly until the Blue Geese disappear entirely.

On November 1, 1917 a count at the Vermilion Bay goose beach showed 31 Snows and 1,250 Blues.

I quote from my letter to Mr. Paul G. Redington, chief of Biological Survey, Washington, D. C., written from Avery Island, October 27, 1928: "In 1928 the second migration of geese began to arrive here on the night of October 25. Flocks passed over all of that night, all the day of the 26th, the night of the 26th, and are still passing at midday today. Yesterday afternoon between 4:10 P. M. and 5:20 P. M. I counted fifty-two flocks going south to the marshes. The total number was six thousand and nine individuals, seven hundred and twenty-eight Snows, and the rest Blues, an unusual percentage of the former."

On December 6, 1928 I counted the flocks flying from their roosting place at the west end of Cheniere au Tigre and going east to Hell Hole, where they were feeding. To quote from my note book of December 6, 1928: "This morning I counted for one hour and a half the geese passing over from their roosting place south of Beef Ridge in the pasture, to where they were feeding near Hell Hole. Could not count all the flocks as sometimes six to ten were near together and they were flying only about four hundred feet high. Most of the flocks passed right over my head, and each flock counted was marked down as it passed. The flocks numbered 316, and contained 219 Snow Geese, and 16,405 Blues."

In a letter to Mr. Fredrick H. Kennard, written from Avery Island on October 21, 1919: I said "A few days ago there was quite a migration of Blue Geese passing Avery Island. They were flying at about one thousand feet in small parties, and one flock would not be out of sight before another could be seen. Often as many as four flocks could be seen at once. The flocks varied in numbers, from eight to thirty-five." Dates for the main migration for several years are as follows: 1891, Oct. 10; 1893, Oct. 29; 1896, Oct. 29 and 1900, Oct. 11. I could bring these migration notes down to date, but there is little variation in them and the above are sufficient to fix the usual time of the principal fall arrival.

Distribution.

Blue Geese during their stay in Louisiana might be called Salt Water Geese, or Salt Marsh Geese, as they are never found feeding

or sleeping more than eight miles back in the marshes from the salt beaches.

Blue Geese are confined to two distinct areas along the coast of Louisiana. First, the section bordering both sides of the mouth of the Mississippi River. This is an area of new alluvial flats and shallow bays extending from the mouth of the river for about thirty-five miles up stream, and extending back on both sides for a distance of about thirty miles. Small scattering flocks are seen occasionally as far east as the islands off the coast of Mississippi, but not regularly. Going west from the mouth of the Mississippi River, after leaving Bastian Bay, Blue Geese are entirely absent until Marsh Island is reached. From the east end of Marsh Island to the mouth of the Mermentau River, a distance of eighty-five miles, is the great winter concentration of these birds. In this section of the coast, including the bay shores and country from four to eight miles inland, winter seven-tenths of all the Blue Geese. Some years there will be a considerable flock in the marshes of Point au Fer on the east side of Atchafalaya Bay, and some winters there will be a considerable flock in the marshes bordering Morison's Pass, but these locations are not regular winter feeding places. On Marsh Island and in the marshes of the mainland west to the Mermentau River, Blue Geese are found in unbelievable numbers all winter long. The reason for these concentration areas is, of course, food.

Realizing the value of this coast section as a wild life refuge (for in it winter vast numbers of all the migratory wild fowl that come to the coast of Louisiana) I, during 1910 to 1914, through the coöperation of Mr. Henry W. DeForest, of New York, and the generosity of Mrs. Russel Sage, the Rockefeller Foundation, and Mr. Chas. W. Ward and through personal contributions, succeeded in purchasing and having consecrated, as wild life refuges in perpetuity, 174,663 acres of this area. Later the Paul J. Rainey wild life refuge of 28,000 acres was established, and as this lies between Marsh Island and one of the protected areas it is an important link in the permanent protection of the winter habitat of the Blue Goose.

Going west from the Mermentau River, the goose population of the coastal marshes is still large, but the Blue Geese diminish rapidly and Lesser Snow Geese increase as rapidly in proportion. After

crossing the Sabine River going west, while Blue Geese are found regularly associating with the Lesser Snow Geese, west, well past Galveston Bay, the proportion of Lesser Snow Geese is so far greater than Blue Geese that except for their dark color the Blue Geese would not be noticeable. Lesser Snow Geese are found regularly with the flocks of Blue Geese at the mouth of the Mississippi River and in the area of Marsh Island to the Mermentau River. The proportion of one species to the other varies in different winters. I would judge the average to be about one Snow Goose to between sixty-five and seventy Blue Geese. After leaving the Mermentau River going west, the proportion of Lesser Snow Geese rapidly increases until at the Sabine River it is about three Snows to one Blue. After leaving the Sabine the Snows increase more rapidly, and at Galveston Bay there is not more than one Blue to seventy-five Snows. From this point west along the Texas coast the Blue Goose is rare.

Food and Feeding.

The Blue Goose while in its winter habitat is not a grazer. It is primarily a grubber, an eater of roots, and is by choice a day feeder, never feeding at night unless in sections where it is greatly disturbed by shooting.

When the Blue Geese first arrive on the Gulf coast in October and early November, if there has been a good crop of feather grass (*Leptochloa fascicularis*) and wild millet (*Echinochloa crus-galli longiaristata*) they will feed, so long as the supply lasts, on the seed of these grasses. This seed, however, lasts at most only a couple of weeks and during the rest of their stay they eat nothing but the roots of the three-cornered grasses (*Scirpus robustus* and *Scirpus americanus*) and the roots of paille salle (*Spartina patens*). In the area bordering the mouth of the Mississippi River they feed to a considerable extent on the tubers and roots of the Delta duck potato (*Sagittaria platyphylla*). These three groups of plants constitute the great bulk of their winter food, although they may occasionally eat other roots or nibble young grass.

There is no more attractive sight in nature than Blue Geese feeding on grass seed. Geese are most sociable birds, and sleep and feed in large companies. In the early morning before sunrise, if the

weather is fine, and shortly after sunrise if the sky is overcast and the morning dark, the Blue Geese leave the spot where they have spent the night and in large flocks, often numbering from several hundred to several thousand, proceed directly to the spot where the morning food is to be gotten. This may be near or may be ten miles or more from their sleeping place, but there is no hesitancy in the choice of the location, for they go to it without wandering, and at once begin their breakfast. The large flocks leaving the night's resting place are not a complete section or even a majority of the great band that had gathered at the sleeping place, but are made up of numerous small flocks scattered through the large gathering at the resting ground. These flocks take the air at the same instant, with much loud calling which begins a couple of minutes before the take-off and lasts until they are straightened out in flight. When they first take the air on this morning flight the birds are jumbled into an irregular mass, but this soon breaks up into definite flocks which quickly separate or fall behind each other until what was at the start a mass of birds covering perhaps a quarter of a square mile, is quickly formed into small flocks, most of them in irregular triangle form. Arriving at the feeding place, the leading flock alights and the others join it again forming a compact mass. One of the peculiarities of Blue Geese is their excessive gregariousness; when on the ground they are usually in large compact masses. If breakfast is to be of grass seed, a most attractive sight is now to be witnessed.

Feather grass and millet grow in the same sort of wet land. The feather grass heads at about eighteen to twenty-four inches, while the millet seed stalks rise to four or six feet. The seeds of both of these grasses are eaten by all migratory wild fowl, and are especially attractive to Blue Geese. They often cover considerable areas, and I know of certain places where in favorable seasons they cover thousands of acres to the practical exclusion of all other grasses.

The flocks of Blue Geese having alighted in an area of seeded grass at once begin to feed.

Walking sedately forward, always facing the wind, they grasp the feather grass with the beak below the seed head, and holding their heads sideways, one eye to earth, one to sky, make a quick upward and backward movement of the head and neck which pulls

the grass between the mandibles leaving the seed packed against the upper side of the bill from which position it falls into the mouth when the bill is opened. When millet is the food, the seed head being much higher than the goose can reach, the stalk is first grasped as far up as possible, a couple of steps are taken pulling the stalk down and a new hold taken just below the seed head and the grain stripped as before. As the flock advances into the wind those in the rear take wing and alight in front, all as near the leader as possible and at once spread out like an opening fan, feeding as they go. This constant rising from the rear and alighting in the front gives one the impression of a great ball being rolled slowly forward.

After their morning hunger is appeased the birds spend the middle of the day in close compact flocks, and so quiet are they, and so seldom does a goose take wing, that unless their location is known, it would not be supposed that a band of many thousands of birds was in the vicinity. About 3:30 P. M. they begin to feel hungry again and small flocks will be seen rising from the lee side of the mass and going to the front. In half an hour after the first feeding begins all of them are so engaged, the evening action being the same as in the morning. Just a few moments after sundown on a bright day, or before sundown on a cloudy day, the return to the roosting place is begun in exactly the same way as the morning flight to the feeding ground. There are usually six to ten risings on each occasion before all of the big band will have shifted from roosting to feeding ground or vice versa. When the numerous small flocks take wing, not all the individuals continue on their flight, for some, finding that their particular company has not taken wing, will return to the main body again.

It is not every fall that grass seeds are available in sufficient quantity to be a real factor in the food of Blue Geese, since it is only when the low marshes are dry in the summer that the seed of these grasses sprout, but when conditions are favorable for a heavy growth it is certain there will be great numbers of Blue Geese, Mallard and Pintail ducks feeding on the seed as long as it lasts.

The staple food of Blue Geese is the heavy roots or rhizomes of three-cornered grass and paille salle. At times and apparently without reason, they seem to feed exclusively on one root or the

other. Both of these grasses grow in the brackish water marshes immediately back of the beach ridge along the Gulf and its bays. The same roots also form the principal food of the muskrat. When feeding on these roots the geese prefer to use a section that has been freshly burned over. They will fly a considerable distance from their roosting ground to find such a feeding ground although they fly past thousands of acres of the same grasses that have been burned for some time; these, however, have sprouted a young growth of green shoots and are not so desirable.

In the early fall it sometimes happens that no fires have been set in the marshes, due to excessive rain and mild weather keeping the grass green, and finding no "burns" to feed upon the geese will circle round in the air in large flocks with much calling and no regular formation until the leaders select a spot at which feeding may start. Then the entire flock, often numbering many thousands, will slowly settle over the chosen feeding ground where the grass may be four or five feet high and literally beat it flat with their wings. In this beating process the flock keeps in a compact mass and hovers over the grass going lower as the stalks are beaten down, until the birds disappear in the green growth. I have watched this clearing of a feeding place many times and have never ceased to wonder at the sagacity of these birds in using mass effort to gain a desired end. As soon as a large enough area is mashed down so that the birds can begin their feeding, it is rapidly enlarged as the roots around the edges are pulled up. This clearing of a feeding place is only done in three-cornered grass the stems of which are soft and pithy and are easily beaten down. Paille sale is a stiff wire grass, and I have never seen the geese try to clear a feeding place in it. The three-cornered grass has a large, heavy, hard root stalk or rhizome, and this is what the birds feed on. To get at these each goose digs with its beak a little well by removing the peaty soil and small roots until a rhizome is reached, this is grasped firmly in the beak and with a pulling power not to be expected in a bird of this size, the root is drawn out. If the section is too long to be swallowed, it is beaten on the ground by vigorous shaking of the head until broken or reduced to the proper size. It is remarkable what large pieces of root a goose will swallow and I have taken from the throat of a Blue Goose sections of rhizomes fully three-

fourths of an inch in diameter and three and a half inches long. The stomach cavity of the Blue Goose is larger in proportion to the size of the bird than in any bird I have seen, and the gizzard is enormous. When feeding, the latter is packed with food as is the esophagus. In pulling up the rhizomes of three-cornered grass, if after a good hold is gotten on the root, it cannot be pulled up by twists of the head and neck, the feet are moved up, wide apart and close to the beak, then bracing itself with the tail a pull is made with the combined muscles of the legs, back and neck. If the first pull is not sufficient to loosen the root the hold is shifted, and the effort renewed,

After an opening is gained in a bed of roots the feeding is somewhat easier, but considerable effort must be used for each root. The fine fibrous roots of three-cornered grass are discarded and only the rhizomes eaten. When the geese have cleaned up a section of ground and there is no water on the marsh, it has the appearance of a piece of old turf land that has been gone over many times with a spring-toothed harrow, leaving the grass roots in fuzzy tufts scattered evenly over the surface. If water is over the marsh, the feeding area presents a smooth surface of muck about ten inches in depth.

At times a large flock of geese will persist in feeding on an area of three-cornered grass until every root is pulled up. When this is done what is locally known as a "crevey" (meaning a place where all growth has been killed) is formed. These "creveys" are sometimes several miles long, and becoming covered with rain or tide water shortly after being dug by the geese, the small floating particles of vegetable discard are floated to the side and form low banks preventing their drainage. These "creveys" then become shallow ponds and it may be many years before grass grows over them again. I have seen creveys made more than forty years ago that are still open ponds. Many of the marshes frequented by the Blue Geese are used as cattle ranges in winter and it was for a long time customary for the cattle owners to keep men on horse back armed with guns to ride the range and keep the great flocks of geese moving so that the grass would not be destroyed. It was found quite useless, however, as often the flocks were so vast that they could not all be frightened into the air at one time, and the geese

near the man who was shooting would rise and alight on the other side of the flock, so this practice has been given up.

When feeding on the roots of paille salle (salty grass) the geese always select a fresh "burn" and follow about the same procedure as in getting the roots of the three-cornered grass. The rhizomes of paille salle are finer, however, and much easier to pull out. This grass makes an exceedingly heavy turf; the roots being matted thickly for more than a foot in depth. The geese, however, do not dig down for these roots more than three or four inches, so creveys are not often formed.

In order to digest the hard woody roots that constitute their food requires a large powerful gizzard and much grit. As there is but little sand and no gravel on the coast of Louisiana within the Blue Goose wintering area, the birds at times must travel a long distance to well known sand banks to get their grit. There are only two sand banks available in the territory between the mouth of the Atchafalya River and the Mermentau River. One of these is the famous Goose Bank on the southwest shore of Vermilion Bay; the other is a low marsh about two miles west of Chinere au Tigre, in Vermilion Parish. The Goose Bank on Vermilion Bay has been from aboriginal times the principal graveling place for the geese of Marsh Island, the marshes around Vermilion Bay, and a considerable distance west along the Gulf of Mexico. Bordering this beach on the west is a deep, small bayou, and about one thousand feet up this bayou is a large Indian kitchen-midden or camp mound made of clam and oyster shells. In this are many goose bones, and each storm tide with heavy waves washes out on the beach flint arrow heads that were evidently lost when their owners shot them at geese on the beach. Later this spot was the favorite place for sportsmen and market hunters to dig pits and lie in wait for the great flocks of geese that come daily for grit. The sandy part of this beach is 1011 feet long and 37 feet wide. I doubt if there is any one spot in the entire country where so many Blue Geese have lost their lives. It was to preserve this sand beach, for the use of the geese for all times to come, that led me to induce Mr. Chas. W. Ward to join me in the purchase of thirteen thousand acres of land surrounding it covering some of the most important Blue Goose feeding territory on the Gulf coast and deed it to the State of

Louisiana as a permanent wild life refuge, on July 25, 1911. Since that time many Blue Geese have been shot on that beach with a camera, but none with a gun.

I have spent many days in a blind on this beach watching the geese take sand and promenade in family parties up and down its hard smooth surface. I will quote from my note book under date of November 1, 1917: "First flock came to the beach at 6:25 A. M. twenty-one Blue Geese, next flock at 6:33, then a steady stream of small flocks. At sunrise nine minutes before seven o'clock there were about 1200 geese on the beach all Blues except thirty-one Snows and twelve White-fronts. The nearest geese are within twenty feet of me as I write. The farthest, not more than one hundred feet. Most of them are in the shallow water or at the water's edge busy eating sand. They take their sand standing in shallow water; holding the bill vertically on the sand opening and shutting it rapidly until a little hole is dug, and the bill is sunk until the water comes up to the bird's eyes. This is done to wash the fine sand and mud out of the hole, and allow the coarse sand to settle. Then the bill is opened and closed more slowly washing the fine sand out of the mouth, while the coarse sand is swallowed. When sufficient sand has been eaten they go onto the dry part of the beach and leisurely stroll about; often in family groups, greeting one another with much bowing of the head, and chattering in low voices. Each flock spends about one-half to three-quarters of an hour at the beach before returning to the feeding ground.

"All morning until three-thirty o'clock in the afternoon small flocks of geese were continually coming and leaving. It is remarkable how little attention they pay to me. My blind is made of drift-wood and is quite open, and when I am taking pictures with the motion camera, my side and all the camera are exposed, but the geese pay no attention except that occasionally a family party will in their promenading be attracted by the camera and come up to its foot to see what it is."

I have spent many days on this beach watching the geese, and their tameness has always been a cause of wonder. It is quite remarkable how soon these birds lose their fear of man where man protects them from harm. Here at the Goose Beach, as on the great game sanctuaries along the Louisiana coast, the Blue Geese

are almost as tame as barnyard fowl. On the sanctuaries the muskrat trappers walk or ride through the feeding flocks daily, and as they never harm the geese, no more attention is paid to them than to a cow or horse. It is interesting to note that geese do not take sand every day. I learned this fact by watching for certain geese which had distinguishing marks, and found that they came only every second or third day.

The second place mentioned where the geese get their grit is in what is known as "the pasture"—a fourteen thousand acre body of land north and west of Chinere au Tigre, and extending along the Gulf coast to Fresh Water Bayou. This area, I am sure, harbors more Blue Geese year in and year out than any similar tract of land on the Louisiana coast. There seems to be here just the conditions of food and roosting places that the geese love, for they come here every winter in vast numbers. The spot is about a mile and a half west of Chinere au Tigre and about one and a half miles inland from the Gulf and consists of a series of shallow sand bottom ponds that are visited daily during the winter by thousands of geese.

These ponds were up to 1912 favorite spots for the goose hunters to build blinds with the assurance that they would kill all the geese they could carry out. In 1912, I bought this land and closed these ponds to all shooting, and since then the geese have used them without molestation. As the sand in these ponds seemed to be getting exhausted, I, in the season of 1930, had dug a ditch wide and deep enough to float a considerable boat, and leading from one of my canals to the sand ponds. I secured from one of the gravel companies of Texas some specially screened gravel about the size of a No. 4 shot and spread one hundred and twenty tons of this in one of the sand ponds that winter. During the winter of 1930–31 this pond was at times so covered with Blue Geese that no more of them could get in it, and the ground for a considerable distance all around was also covered with the birds. So popular was this gravel, that after the geese had gone north I caused an examination to be made to determine how much of it was left, and I believe it would be impossible to gather with a sieve ten bushels. The geese had consumed practically all of it.

Spring Migration.

About the tenth of March the Blue Goose population of the Gulf coast begins to gather in two or three great bands. One of these is on the flats on the east side of the mouth of the Mississippi River; one on Marsh Island or Chenier au Tigre, and one in the vicinity of Bayou Constance.

Some years there is only one band in the area from Marsh Island to the Mermentau River. When this occurs this band is huge, covering a space from three to five miles long and from one half to a mile in width. The reason for these great gatherings is the approach of the northern migration. I have seen great concentrations of birds in many parts of the world, but nothing to equal the gathering of Blue Geese preparatory to beginning their spring flight. In a few days after they begin to gather only an occasional straggling goose will be seen away from the great flocks. These flocks do not go far for food and water, but always select as a gathering place a spot where food conditions are right and there they stay until they depart on their flight. The habits of these birds change materially during this pre-migration gathering. They become lazy, feed but little, are extremely noisy, fight among themselves, and at times a great section of the gathering will take wing and circle round calling loudly, then suddenly return to the main flock.

During these gatherings the unmated birds select their mates. This causes conflicts among the males and they fight hard and long, using the beak to hold the opponent, and both wings to beat him with. I was camped at the mouth of Fresh Water Bayou (which is the western boundary of my land in Vermilion Parish where it joins the Gulf), between March 14, and 21, 1891, the marsh bordering the beach between Fresh Water Bayou and Mulberry Island being the spot chosen that spring for the Blue Goose migration gathering. I have never forgotten that experience, nor have I ever heard so much continued noise. The edge of the big flock was not more than two hundred yards from my camp, and at night geese completely surrounded it even coming in between the two tents. There was never a moment day or night during the seven days I was there that the air was not filled with the shrill calls of the birds. For days and nights afterwards my ears rang with this peculiar noise. At Mulberry Island, at that time, lived Francois Pradier, a

negro, with his wife and four children. This man was in charge of the cattle on that section of the coast. I saw these six people with loud popping bull whips and tin pans try for several hours to move this flock of geese away from their house. They might just as well have tried to push back the smoke of a prairie fire. The geese, as these people advanced into the flock, simply got out of their way and closed right in behind them. Near their house was a shallow lagoon in which the geese stirred up the mud and water until it was like a thick paste and in their fighting got their wings so heavy with mud that they could not fly. Francois made tight a section of his calf pen and he and his family drove the mud covered geese into this pen until it was full. There seemed to be between four and five hundred geese in the pen. Francois said he had plenty of salt with which to salt hides and would kill these geese and salt them for his summer meat supply. I did not see this flock leave on migration, but Joe Pradier who came to my home about ten days later said the geese all left, except a few, six days after I had gone. This would make the date of the migration flight that year, March 27.

Another of these great spring migration gatherings of Blue Geese that I witnessed was in the last days of March 1914. I quote from my letter dated March 28, 1914, to M. L. Alexander, President of the Conservation Commission of Louisiana: "Due to the geese being disturbed in the outlying districts of Marsh Island, they have congregated for their spring migration in one vast flock quite near the warden's house, where they are thoroughly protected. On going through this flock with the warden in order to make an estimate of it, we found the flock to be solid for a distance of two and a half miles, and from one half to three-fourths of a mile in width. In riding through it, the geese were so tame that they would not take wing, simply walking away from the horses a few feet to the side of the path, and all the time we rode through the flock there were geese within ten or fifteen feet of us on both sides. We estimated this flock to contain from one and a quarter million to one and a half million geese." This observation was made on March 25, 1914, and this flock left on migration on the afternoon and night of March 28, as I was informed by warden Remik Saunier, who was in charge of this portion of Marsh Island at that time. I have witnessed these migration gatherings of Blue Geese very often and

have seen the birds pass over my home by the thousands of flocks on their way north for more than fifty years, but only twice have I witnessed the actual start of the movement. The first time was in 1916.

I had learned from the trappers late in March that the geese were in great numbers at Bayou Constance on the Gulf coast of Cameron Parish and I left home in my boat on the morning of March 24, reaching Constance Bayou at 3:40 that afternoon. For a considerable time before we reached Constance we could see great numbers of geese flying up and alighting in the marshes just back of the beach ridge. When we tied up in Constance about six hundred feet inside the Bayou, there were geese within one hundred feet of my boat and in looking over the marsh which had been recently burned I could see nothing but geese as far eastward as the eye could reach, but not a goose to the west of the Bayou. As we needed some fresh meat, I took my gun, and with one of my men walked about two hundred yards into the flock, fired one shot and we had all the geese that two of us could carry to the boat. The birds made so much noise that night that no one on the boat could sleep, so at two in the morning we ran up stream about a mile and a half where the noise could be heard only faintly. The next morning, March 25, I was on the beach early and walking almost to Bayou Rollover, a distance of about eight miles, found geese along the entire stretch. In some places the flock was almost a mile wide, in other places only a few hundred feet, while some three miles east from Constance the flock was often broken by considerable areas of standing grass. There are a number of large brackish water lagoons just back of the beach in which the geese drank and bathed. On March 26 I spent the whole day going through this flock of geese and as I walked, the edge of the flock was at no time more than fifty feet from me. During the afternoon of the 26th the flock seemed very uneasy. At times almost all of the birds would take wing and with great gabbling and calling circle round and round and then suddenly alight again. On the 27th, I was in and out of the flock all morning, the geese were just as uneasy as the evening before, until about 12:30 P. M. when they became very quiet, hardly making a sound. I was sitting on a drift log watching the flock when at 2:15 without any noise or warning, small flocks arose at widely

scattered intervals and without circling, started north. There was no attempt to gain altitude immediately, but there was a gentle upward grade until, when the flocks were half a mile away, they were not more than two hundred or three hundred feet off the ground. This departure continued without any regularity but constantly until dark, and I judge that by the time it got too dark for me to see them leaving, about one fourth of the flock had gone. This movement continued all night, for there was considerable calling and I could hear them in the distance as the small flocks moved along. In the morning of the 28th there were not more than four or five thousand geese where there had been a couple of millions the day before. As these flocks moved on migration I had ample opportunity to count the number of birds in many flocks; in none was there less than six or more than sixty-one. These two figures are the extremes.

I have on a number of occasions had goose eggs brought to me that were picked up at the migration gathering, and during the three days at Constance Bayou we found two goose eggs.

The next migration that I witnessed was in March 1922. The great pre-migration gathering that year was on Belle Isle ridge on my land four miles north of Chenier au Tigre. I went out with a moving picture outfit and operator to get pictures of the birds. This part of my land is divided by canals into two square tracts containing four square miles each, and the geese pretty well covered the square in which Belle Isle (a ridge a few feet higher than the surrounding marsh) is located. On March 18 I looked the flock over and decided on the best location for the picture taking. I noticed the central part of the flock was pretty solid, but the outside portion was made up of scattered bands and groups of birds, from a few hundred to several thousand. What I wanted was a picture of the whole flock massed. To get this the geese would have to be driven into the proper position. The morning of the 19th was clear with a light breeze from the west. At ten o'clock we left camp, as at that time I could see the geese had ceased feeding and were quiet. I sent four men in a motor boat to the eastern end of the square and four men on horseback rode through the flock and joined the men on foot. My chief warden, Lionel Le Blanc was in charge, and I had instructed him to line the men on foot about one hundred

Photos by E. A. McIlhenny.

UPPER.—BLUE GEESE IN FLIGHT.
LOWER.—BLUE GEESE ON BEACH AT VERMILLION BAY, LA.

and fifty yards apart opposite the thickest part of the flock and to place the men on horseback two on each side of the men on foot, and for the line then to advance towards where I would be located with the camera. I placed the camera about the center of the ridge to the west of the main flock and between it and a small flock of a few hundred birds. I then had geese on both sides of me, about four hundred feet in front and two hundred feet behind. By 11:30 A. M. the men started putting up the outlying flocks to the east, and the geese did exactly what I had expected; flew down wind over the main flock, turned up wind and lit on the western edge of the main gathering. In less than a half hour the camera was completely surrounded with geese, and the space between the main flock and the one to the west was covered with geese so thickly that no more could alight and they then began piling up behind the small flock. As we operated the camera we were standing in the open without anything to hide us and not a blade of grass in sight, for the geese had pulled up every living thing in their grubbing for roots. There we stood working with the camera and geese so near that it had to be focused over the nearest so that the mass would be in focus. The noise made by the birds was so deafening that in order to give directions to the man operating the camera I would have to pull his sleeve to gain attention, as he could not hear my voice even when I spoke loudly. Desiring to get a picture of a mass of geese in the air I had the men wave their coats and yell at the top of their voices. This started a portion of the geese between them and the camera into the air and I secured a wonderful picture of a million geese as they arose in a compact mass. The film shows the sky so covered that no light can be seen through them, and the horsemen are completely hidden.

On March 22 I went back to my camp at Belle Isle with the intention of staying with this flock of Blue Geese until they left for the north. The 23rd and 24th were spent looking over the flock. I walked through it, around it and sat in it for two days. The flock was much more compact than when I first saw it on the 18th. The geese scattered somewhat while feeding in the morning from daylight until about eight-thirty, and in the afternoon from about four o'clock to sundown, but they did not seem to be hungry and fed but little. In the middle of the day and at night the scattered

feeding flocks all came to the main flock and there was a great amount of calling and honking and much fighting. The geese were far more noisy during the middle of the day and at night than during the feeding periods. When the flock was concentrated in the middle of the day it covered about one and a half square miles. Lionel and I estimated it to contain at least one and a half million geese. We estimated between two and three thousand Lesser Snow Geese; all the others being Blues. As these birds were on good solid ground, I took a horse on the morning of the 25th and spent the day riding through the flock. The horse at times would almost step on the geese, and often many geese would be within five feet of my stirrups. The sun was hot that day and the birds seemed lazy and not as active as usual, and fed very little.

On the morning of March 27 I again watched this flock from horseback. Three times the whole flock rose, milled around for a few minutes over the place where they had been and then came to rest again. While in the air the honking and calling were deafening. At 11:30 A. M. the flock was very quiet and pretty much all of the geese sitting down. At 2:30 P. M. suddenly small flocks took the air and flew off without circling or turning. I held my compass on them and their course was due north. All afternoon, every few minutes, small flocks would leave the big flock and head north. There was no wavering or uncertainty in the movement, nor was there any regular interval between departures, which varied from seven to twelve minutes. The size of the flocks varied from five to forty-three. The small flocks rose without any audible signal and from no special part of the large flock, but several would start simultaneously from various parts of the big flock. These small flocks flew in a wavering somewhat straight line paralled to the direction they were headed. The Snow Geese took off with the Blues, sometimes only one white bird in a flock of Blues, sometimes three or four, often none at all. I stayed right in this flock until dark and at that time small flocks were leaving about as fast as when they first started. The migration must have continued nearly all night for in the morning there were only about five thousand geese left on Belle Isle. The remainder left on the afternoon of the 29th, except about three hundred birds that were probably too weak to make the flight. In the spring of 1931 the migration gathering was in

my pasture at the west end of Cheniere au Tigre. The migration flight started the afternoon of March 25. The gathering of March 1931 was in the same place and started the afternoon of March 28. Mr. A. M. Bailey of the Chicago Academy of Sciences, took moving pictures of this flock when it first began to gather.

Plumage and Voice.

What is the typical adult plumage of a Blue Goose? This question is one that I have never been able to solve for myself. There are far more Blue Geese with more or less white on the under parts than there are without white. I have shot thousands of these geese, have kept hundreds of them with wings tipped and have seen millions of them, from the young following their parents and still giving the gosling call of "tee-tee-tee," to the old fully mature bird. I have therefore had ample opportunity to observe these birds, and due to the extreme variation in the under plumage I have never decided which plumage could be called typical. There are only two parts of the plumage of adult Blue Geese that never vary; the head, which is always white and the wings which have always the same marking. I have seen Blue Geese without a dark feather on the entire body, but the wings were like all other Blue Goose wings. I have seen others without a white feather on the entire body, the dark slate of the body feathers extending up the neck to the head, but the head was white and the wings were marked like all other Blue Goose wings. It seems to me to be entirely unreasonable to think that Blue Geese which have white on their underparts are hybrids from a mating of Blue Geese and Lesser Snow Geese. There are far more Blue Geese with white on the underparts than without.

In hybrids of other birds that I have seen, there is never any definite plumage pattern or marking that was regular, but a combination of the plumage of both parents in ever changing variety. No two have had exactly the same markings. I have cross bred various wild ducks in the hope of establishing by selection a feather pattern and form that could be perpetuated after inbreeding several generations, but never succeeded in establishing an unvarying feather pattern, and the changes in the feathering of the wing shows most often. If the white bellied phase of the Blue Goose is

a hybrid there would be at least an occasional bird with a change in the plumage of the wings, but this I have never seen. I therefore doubt these two species interbreed, except very rarely. Mr. George M. Sutton, in 'The Auk' for July, 1931, plate V, shows an excellent drawing of two white bellied Blue Geese. Under this illustration he states: "The Female (right) is a hybrid Blue × Lesser Snow Goose." Why he makes this positive statement I fail to understand, as both these birds are white-bellied Blue Geese. On page 359, of the same article he says: "the female of the nesting pair of Blue Geese which I found at the head of South Bay, and whose nest and four eggs I collected on July 14, was rather a blotched bird also, the belly being white and the dark chest and sides marked with spots and mottling of white." Further on he states, "at the famous feeding grounds of the species at the southern end of James Bay I personally saw many Blue Geese which were so much blotched as to merit the term 'piebald'."

I wonder where these "piebald" geese go? They do not come to the Gulf coast of Louisiana or Texas, or I would have seen some of them. In the thousands upon thousands of these birds I have carefully observed, I have only seen one Blue Goose that had a spot of white on the chest surrounded by dark feathers. This was a two-year old bird, brought to me alive by a muskrat trapper. I have this bird now. It is eleven years old, and what was at first a white spot is now a white breast as the white spot increased down and across with each July–August molt until the white breast spot extended to the white of the belly.

In 'The Auk' July 1931, in speaking of a migration of geese, Mr. Sutton says, "I venture the guess that fully twenty-five per cent of these flocks of migrants were Blue Geese, though it was impossible to distinguish satisfactorily the young of the Blue Geese from the young of the Lesser Snow." I again must differ with Mr. Sutton. The young of these two birds can be distinguished, as far as the human eye can tell the difference between a light and a dark object. The young of the Lesser Snow Goose is distinctly light, the young of the Blue Goose is distinctly dark and the same color all over. There is no white on the *belly*, *breast* or *back* of the first juvenile plumage. There is, however, a lightening of the feathers covering the areas that are to be white in the adult. In some

Photos by E. A. McIlhenny.

BLUE GEESE GATHERING FOR MIGRATION ON BELLE ISLE, LA., MARCH 19, 1922. THIS FLOCK WAS A MILE AND A HALF LONG AND OVER HALF A MILE WIDE.

individuals that I have had in captivity for many years, the white of the belly has gradually increased up the breast until the entire breast and chest became white. This increase in the area of the white of the underparts grows little by little with each July–August molt, sometimes requiring five or more years to be completed. My observations of the white underparts of Blue Geese kept in captivity is that in the first juvenile plumage the young show no white on the underparts, but there is a distinct lightening of the area on belly and breast (due to white tips of the dark feathers, which white tips wear off before the feathers are actually molted) that will become white with succeeding molts. That this white underpart will cover part of its area on belly during the first molt, the fall and winter after hatching, and the white area will increase with each molt sometimes for as much as eight years. The adult Blue Goose molts only once a year in July and August.

Mr. Sutton says (page 363): "Strictly speaking neither the Blue Goose nor the Lesser Snow Goose of Southampton Island can be considered today an absolutely pure-blooded species." This is rather a broad statement and may be true, but these hybrids do not migrate to the Gulf coast for their winter home, or I would have seen some of them during the more than fifty years I have shot and observed these birds. I have never seen a hybrid Blue Goose nor have I ever seen a hybrid Lesser Snow Goose, and I am just as familiar with the great flocks of Lesser Snow Geese of the Texas coast as I am with the Blue Geese of Louisiana. Because the majority of Blue Geese have white bellies and some have white breasts and an occasional one is all white except the wings, is no reason to say that they are hybrids. The Blue Goose happens to be a species in which the feather coloring of the underparts is variable.

I quote from my notes of November 2, 1917, written while watching these birds from a drift-wood blind on the Goose Beach of Ward-McIlhenny wild life refuge in Vermilion Parish, Louisiana, "A very juvenile Blue Goose within ten feet of me as I write (one of a family of four) is one that will be all white except the wings in the adult plumage. It has a uniform body plumage of very light slate, a white throat, white spectacles and white surrounding the bill about one half inch in extent; no other white feathers. It is much lighter than the three other young of this family. The two

old birds are normal with only the usual amount of white on belly, and three other young are normal. The head and upper neck of the very young are dark slate almost black and show no white feathers in the first plumage except a white ring around the eyes and a white chin patch. The white on the head begins to show in scattered white feathers on the cheeks and about the face when the juvenile molt begins in the fall."

"Many old and young in second plumage show a very distinct mottling of the breast due to the center of the feathers of the new and unworn plumage having dark slate centers and lighter tips. In many instances the two old birds are followed by their young, mostly four, sometimes three, and there is near me one brood of five. The old birds march sedately along, the male leading, nodding and gabbling to and with those of the company he apparently knows, the young following in single file paying no attention to the assembled multitude, and in the rear, keeping a watchful eye on the brood, comes the female. Families in this formation promenade up and down the hard smooth beach frequently passing within a few feet of where I am sitting partly hidden in my drift-wood blind, but showing not the slightest fear of me."

"In general the second plumage of the young is much lighter than either the first plumage or the adult plumage. The legs and bill of the very young are dusky almost sooty, while the legs and bill of the adult are bright reddish pink sometimes with a slight purple tinge."

"The old birds call to their young when walking or resting on the beach in a low deep 'cawk,' the young answers 'tee-tee-tee.' The call of the adult Blue Goose is 'awnk, awnk-ink and quank,' in many different tones."

When shooting Blue Geese I usually select a spot between the feeding and roosting ground, or between two feeding flocks. At such a time I make no attempt at concealment until I hear the geese calling excitedly and rapidly; I then hide for I know at once a portion of one flock will take wing and join the other. This leaving call is much shriller and more rapid than any other, and must be to notify the different individuals belonging to the several small bands that they must be on their way.

Mr. J. Dewey Soper, in his excellent pamphlet 'The Blue Goose'

in speaking of the juvenile plumage says, on pages 17–18, "In general appearance the juveniles are slaty brown in color and dusky as compared with matured individuals, but like them may have a variable amount of white on belly and flanks." I have never seen juvenile Blue Geese that had white feathers on the belly. The feathers on the belly in the juvenile are often tipped and edged with white, giving the effect of having been lightly powdered with white, but this light edging wears away, and white feathers do not appear until the first fall and winter molt. The feathers on the head and underparts are generally stained a reddish brown, due to these feathers coming in contact with the marsh mud and decayed vegetable matter from which these birds dig their food. Birds kept in clean high grass land lose this stain and the feathers are then their normal color.

Enemies.

Blue Geese during their stay in Louisiana have only one serious enemy, and that is man. Man kills them both for sport and for food, but the number of Blue Geese killed during any winter is but a very small part of what should be the normal increase. I am sure the entire kill by hunters is not in excess of 10,000 birds, and the muskrat trappers probably catch and kill that many more. Outside of this 20,000 a few are taken by Bald Eagles, and I once saw a Duck Hawk catch one. There are no other enemies.

I have on a number of occasions found dead Blue Geese and parts of them in the nests of Bald Eagles. Young eagles are hatched in late December or January, and the principal food supplied by their parents is ducks and geese and often Blue Geese. I was camped at the mouth of Fresh Water Bayou in Vermilion Parish in January 1895, and daily for six days witnessed an unusual and interesting sight. A pair of Bald Eagles had their nest in the top of a large live-oak tree on Beef Ridge about one and a half miles back from the beach, and the nest contained two young eagles. A very large flock of geese was feeding in the marsh on both sides of the bayou, only a short distance from my camp. I was sitting outside the camp at about eleven o'clock, when my attention was attracted to two Bald Eagles coming from the direction of their nest, which could be plainly seen from where I sat. As they neared the flock of geese which was sitting quietly on the marsh and beach, one of the

eagles, the larger one, which I learned afterwards was the female, started upward, circling. The other eagle flying slowly came to the flock of geese and swooped down as if to make a strike. A lot of the geese toward which he was darting rose and changed their position flying to one side or the other. He flew among them, and I expected to see him make a kill, which he could easily have done. Instead he turned and came back swooping at the main flock sitting on the ground, again many of the geese took wing and flew to the other parts of the flock; the eagle flying very low tried to get under them but they alighted and he turned and came back at the geese sitting on the ground. All this time his mate was slowly circling on the sea side of the flock. After the smaller eagle had made five or six dives at the flock on the ground he got under three geese that had become frightened and began to climb. Instantly the larger eagle swooped with a rush, joined her mate and both started circling under the rising geese who were going up and inland, as fast as they could. The smaller eagle circled slowly under the geese, the larger one very rapidly around them gaining height fast in large circles. When the geese were about five hundred feet in the air, one of them left the other two. Then the smaller eagle narrowed its circles under this goose driving it rapidly higher. Suddenly the larger eagle which had gotten considerably higher than the goose, shut its wings and shot with great speed down at it, struck the goose fairly and with bowed wings flew to its nest, its mate following. The eagle carrying the goose did not flap its wings after the strike until obliged to check itself to alight on its nest. The smaller eagle did not attempt to catch a goose then or at any other time, and I saw this same performance every day while I was in camp and always about the same time each day. I visited this eagle nest while I was in camp and counted the heads of thirty-one Blue Geese, fourteen Mallard ducks and seven Pintail ducks. The young eagles were about three weeks old.

There is a Bald Eagle's nest near my home at Avery Island in a big cypress tree that has been occupied for more than fifty years. I have seen these eagles occasionally catch a goose, but their favorite food is Coot, and during the time the migratory wild fowl are here and the eagles have young to feed they make a couple of trips every day to one of my duck ponds and each time they catch a Coot or crippled duck.

In the old days when the only means of getting about the bayous of the marshes was by wind or man-propelled boats, few Blue Geese were shot, as they inhabited out of the way places which were hard to get to, and sportsmen rarely spent the time and effort necessary to go after them, and the natives who lived near their haunts preferring ducks for food, rarely shot a goose. Since the internal combustion engine has made quick and cheap water transportation, the Blue Geese wintering at the mouth of the Mississippi River are constantly bombarded, from the opening of the season until its close. The geese are shot at so much, that they leave the marshes and go to the shallow flats outside the mouth of the river to spend the night. Each week end many parties of gunners leave New Orleans and go down the river in fast power boats, each having on board a number of shallow draft duck boats. A quantity of willow saplings are cut along the lower river and before daylight the coast between the roosting place of the geese and their feeding place farther inland, is lined with makeshift blinds each containing one or two gunners. If there is a strong off shore wind the geese will go inland fairly low, if the wind is light or from the Gulf they fly high. The gunners get plenty of shooting, for they are provided with heavy buck shot for the high ones, and fire at every flock that passes over, for with buck shot an occasional goose may be killed at a height of five hundred feet. More geese are killed at the mouth of the Mississippi River than on all the rest of the Louisiana coast. As I have caused almost all of the Blue Goose concentration area between the east end of Marsh Island and the Calcasieu River to be closed to shooting, there is now but little hunting of geese in this territory. If they are shot a few times on open territory, they go to the refuges where they have learned that they are safe and it is remarkable how quickly they learn to know the protected areas and how tame they become on them.

The scattered natives living along the coast kill a few thousand Blue Geese each winter and salt them for summer meat. When they go out to get geese they want a lot of them, and will not fire at a flock unless a large kill is ensured. Some of them have two trained oxen hitched together with rather a wide yoke, attached to which and dragging between the oxen is a narrow sled on which the hunter sits. He drives his team of oxen, slowly to the lee of the flock and

on an angle which will bring him diagonally to the thick of the flock. With this method of approach he can go into the flock and to any part he chooses. He will not fire until he is sure of a big kill. I have frequently seen from twenty to thirty-six geese killed in this way at a double discharge of a twelve-gauge gun loaded with No. 4 shot. Another method practiced by the natives is to ride a horse as near as possible to one of the big flocks, unsaddle the horse, take off the bridle leaving only a small rope around its neck with a half hitch around the horse's nose and the end of the rope tied to the hunter's belt. The hunter starts the horse walking so as to reach the geese an on easy angle, and keeps hidden on the side away from the birds. With his shoulder against the horse's shoulder and with the rope from the nose in his hand the hunter guides the horse at pleasure, and has no trouble in getting to any position he pleases for a shot.

The men who trap muskrats kill more geese in their traps than are killed with guns, in the principal Blue Goose concentration area. Their food being the same both geese and muskrats naturally occupy the same sort of land. The muskrat builds its nest in areas of three-cornered grass, and has runways that it uses in getting food extending quite some distance from the nest. The trapper fires the grass in these areas every winter so he may walk the marsh more easily and find the muskrat paths more readily.

A trapper usually sets from one hundred to one hundred and fifty traps, and goes to them every day. At times the geese will come into the same area and at such a time he will have to move his traps as he catches more geese than rats.

A few years ago a group of trappers on Marsh Island asked me to get permission for them to shoot the geese on the lands assigned to them, for although there were thousands of rats on the land the geese were feeding there in such numbers that the trappers could not catch enough rats to pay for their time and trouble. Of course I made them leave that part of the marsh.

The Blue Goose is not an especially good table bird, and its feathers stick so tightly to the skin that it is impossible to pick them without tearing it. When the local people kill them in numbers and wish to save the feathers for pillows and feather beds, they cut through the skin above the chest and down to the wings

and strip it off the breast and belly. They then cut the breast and legs free from the back-bone, salt the meat and gizzard and put the feathers in sacks with the skin still attached. In a couple of months some sort of a small insect has eaten all the skin and fat, and the loose feathers are then washed, dried and whipped to fluff them and are ready for use.

I have kept Blue Geese with my poultry at Avery Island for a very long time. The tameness of these captives has always interested me. A flock of wild Blue Geese will alight with my tamed ones and follow them to the barnyard, and often the woman who attends to the feeding will catch them in her hands as they eat with the others at her feet. I have wing-tipped Blue Geese in the morning, cut off the injured wing and had them eating out of my hand before night.

There is one danger to Blue Geese as a species that should not be overlooked and cannot be controlled; the cold of the Arctic. On two occasions I have noted a very small number of juvenile Blue Geese on the fall migration: in 1901 and 1917. During both these years, not only were there very few young birds with the migrating flocks arriving on the Gulf coast in the fall, but most of the young had one or both feet missing; due, I believe, to their having been frozen by early cold, before the feathers had grown sufficiently to protect them when sitting. A cold July and August accompanied by snow before the young could fly might easily destroy all or most of the young Blue Geese that year.

The Blue Goose is safe as a species so far as its winter home is concerned. Foreseeing the possible destruction of their winter feeding grounds by the march of civilization I induced others to join me in making the area where the bulk of these birds spend the winter a refuge for them for all time to come, or at least as long as our present method of civilized government shall persist.

It is pleasing to me to know that the system first advocated and put into operation by me of refuges for the breeding and wintering of our migratory wild life has now been accepted as the only sure method of perpetuating certain species, and is now a duty of our Federal Government.

There was one great bird that is now seen only rarely whose migration and feeding habits were identical with those of the Blue

Goose and which always associated with them, fed with them, and slept with them: that bird was the Whooping Crane. I wonder if Blue Geese will ever be exterminated as it has been?

Avery Island, Louisiana.

FIRST STEEL TOWER, 80 FEET TALL, WITH TENT IN PLACE ON PLATFORM, BEFORE NEST NO. 5, WHICH WAS DESTROYED WITH THREE EAGLETS IN STORM OF MAY 18, 1926.

DAILY LIFE OF THE AMERICAN EAGLE: EARLY PHASE.

BY FRANCIS H. HERRICK.

(*Plates XII–XIV.*)

THIS record of observations on the development and behavior of the American or Bald Eagle (*Haliæetus leucocephalus*)[1] was begun at Vermilion, Ohio, in 1922, and field-work at that point was brought to a close by the taking down of our steel tower (successor to that shown in Plate 1), in June, 1930.

My program, however, as it eventually developed, called for the artificial hatching of the eagle's eggs, and the rearing of the eaglets from the down to the juvenal stages. This was accomplished in 1929 and in the spring of 1931.

In earlier papers of this series[2] I have given an account of what was called an "Eagle Observatory,"—the structure erected at Vermilion in 1922,—of the nest and nesting habits, and of late activities at the eyrie, when the eaglets are in juvenal plumage and from six to ten weeks old.

Though compelled to 'put the cart before the horse' in those earlier years,[3] I am now prepared to discuss the artificial hatching of the eggs of the eagle, the rearing of the eaglets in confinement, and the early phases of nest life under natural conditions.

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[1] The 'Southern' Bald Eagle, as distinguished from the 'northern' sub-species, *H. leucocephalus alascanus* Townsend (cf. A. O. U. Check-List). Peters (Check-List of Birds of the World) considers that Linnaeus' name *leucocephalus* applies to the northern race and uses *washingtoniensis* Audubon for the southern bird. Eggs of the larger northern bird (average of 16 specimens) measured 73.5 x 57.5 mm. and those of the southern form 69 x 53.5 (average of 45 Florida specimens). See Allen, 'The Auk,' Vol. XVI, 1899.

[2] See "An Eagle Observatory," 'The Auk,' Vol. xli, 1924; "Nests and Nesting Habits of the American Eagle," ibid., 1924 (republished in 'Rept. of the Smithsonian Inst.,' for 1923); and "Daily Life of the American Eagle: Late Phase," ibid., Vol. xli, Nos. 3 and 4, 1924.

[3] I wish to here express my indebtedness to Western Reserve University, that has sponsored this costly undertaking from the beginning, and to its officers who lightened my academic duties in 1928–1930 so that this research could proceed without further interruption; and I am particularly indebted to Mr. Sidney S. Wilson, Secretary-Treasurer of the University.

I wish to thank also the National Geographic Society for the use of four photographs in its possession or already reproduced in its Magazine.

For the past four seasons I have been ably assisted by Mr. Charles M. Shipman, and the photographs are the joint work of both of us during that time.

When we had completely demonstrated that it was feasible to approach the eyrie of the Eagle by means of a high tower, and when the Great Nest at Vermilion was destroyed in March, 1925, we decided upon a more ambitious program of work than had been earlier contemplated, and to try the experiment of building a steel tower in front of that nest's successor in 1926. (Plate XII).

This work has been prolonged from many causes, chiefly from numerous reverses suffered, such as two nests crashed in storms, and loss of eggs through lack of fertilization, as well as from the desire to check over all activities at different nests, where we could work with different adult and young birds and in differing environments,—not to speak of adverse weather conditions, which often hampered us, and in some seasons rendered our efforts nearly abortive for weeks at a time. It is only fair to say, however, that we never stopped work on account of the weather, and the serious loss of the first steel tower in 1929, delayed, but did not put an end to, our efforts in that and the following year.

By means of the methods early adopted it has been possible to correct certain false impressions, and to weigh the significance of all our earlier observations with greater satisfaction and I hope with greater accuracy. This account, therefore, should be read in relation to what has gone before.

Since it will be necessary to refer to different nests, it may be best to restate the remarkable history of the six successive Vermilion eyries of this eagle, which covers nearly a hundred years, or from early in the nineteenth century to the present time. The first three, about which but little is now known, were occupied from about 1830 to 1890, but there were probably others before that era since there is documentary evidence of eagles in the same neighborhood in the last quarter of the eighteenth century. Nest No. 4, the greatest and most famous of all, is often referred to in what follows as the "Great Nest," and was, perhaps, the largest on record. When measured in 1922, it was 12 feet tall, 8½ feet across its top, and when on the ground its weight was estimated at upwards of two tons. It was destroyed in its thirty-sixth year, in a storm of March 10, 1925. Nest No. 5, which immediately followed this, and before which our first steel tower was erected in 1926, lasted but two years; while Nest No. 6, which I have assumed

belongs to this series, and is just over the eastern town-line in Black River, has been occupied six years (1927 to the present).

When nest No. 5 was wrecked we transported our eighty-foot steel tower eighty miles to another nest at Geneva, in another county, but all to no purpose, since the eggs were apparently not fertilized, and after they had been incubated for nearly six weeks they were destroyed, and as we now believe, by the eagles themselves.

We then moved the tower eighty miles back to Vermilion, and set it up beside nest No. 6, where it remained until up-rooted in the destructive storm of May 2–3, 1929. A second tower, 96 feet tall, and containing four tons of steel, was immediately built to replace it, and at this site all motion pictures were made and later observations conducted. Because of the many delays already referred to, we decided to take the chance of erecting this tower at once, although in that late season the eagles' eggs were then about due to hatch. Fortunately our equipment had not been installed in the tower which fortunately also had fallen away from the eagles' tree. The workmen were directed to begin operations on the new structure at nine o'clock in the morning and to stop work at four in the afternoon, but when it appeared that their presence did not keep the old birds from going to their nest, the work went forward continuously. With the concrete foundations laid, this tower was completed in one week's time, and when on May 23, our observations began, the eaglets, that were then in gray down and about three weeks old, did not appear to have suffered in the least from the noisy operations that had been going on for upwards of seven days close to their nursery door.

2. Sexual Union and Remating.

In mid-March, during the building of eyrie No. 5, which succeeded the Great Nest, sexual union of the eagles was observed by watchers, and their account agrees with what I had previously seen on a number of occasions. When I climbed the wooden tower on April 25, 1924, the brooding bird, identified as the male, joined his mate on what we then called the "tall east perch," at that time the highest point in the grove. This bird then dropped down on the back of the female, and remained for a minute or two, with

much flapping of the wings. This appeared to have been an amorous approach, although no sexual call-note was sounded, but later in the same day when both were again in the same perching tree, it was the female who mounted the male, in the attitude of reversed sexual behavior, like that mentioned by Selous in the Moorhen, and by Huxley[1] in the Grebe. In this instance there was no mistaking the sex, for it was the larger bird that, upon leaving the back of its mate, returned at once with a chitter to the nest. On the following day the behavior of the male just described was noticed again, and must be regarded as an instance of redundant activity, since the eggs had already been fertilized.

Siewert,[2] who has observed very closely the activities of the Screaming or Spotted Eagle (*Aquila pomarina*, Brehm) at a single nest, particularly during the early part of the reproductive period, found that the sexual act takes place once or twice daily from the time of arrival of the birds in April until the eggs, usually two in number, have been laid. At this time a loud, peculiar cry, attributed to the female, was heard, and it was so unmistakable that he could always tell when this action was going on. This pairing call he represented by $ji^{i}i^{i}\ddot{a}^{i}-ji^{i}i^{i}\ddot{a}^{i}-ji^{i}i^{i}\ddot{a}$, the accent lying on the first long drawn out period, while the ä was short and low. At such a time the male seeks the tree where the female is perched, plumps down beside her, and the pairing which follows lasts about two minutes.

In view of the preceding facts I think that Everett Smith[3] was mistaken in supposing that pairing was concerned in the extraordinary aerial manoeuvers which he has described or that insemination, or "sexual union was accomplished high in the air."

The male eagle[4] at the Great Nest was wantonly shot by a hunter on Thanksgiving Day, 1924, and I might add here that this bird had been a target before, as indicated by a contusion where its right shank had been perforated by shot, and a healed break in the tibia

[1] See 'Proc. Zool. Soc.' London, 1914.

[2] Siewert, Horst. "Der Schreiadler," 'Journ. f. Ornithologie,' Bd. lxxx. pp. 1–40, Taf. i–xvi. 1932.

[3] See "The Birds of Maine," 'Forest and Stream,' vol. xx, p. 26. 1883.

[4] The body of this eagle was eventually given by Governor Donahey to Western Reserve University, and is now exhibited at the Cleveland Museum of Natural History, where it was remounted by Mr. Arthur B. Fuller.

of the left leg. After this event the bereft eagle left the neighborhood, and was not seen in Vermilion again for eleven weeks, or until February 12, when she returned with a new partner, and with him began to build up the top of the old nest. Eggs were laid and incubation was under way, when the nest crashed in the storm of March 10, as already recorded.

Again, in October, 1930, some irresponsible person shot the male of this Vermilion pair, but did not recover its body, which was found[2] beneath one of their perching trees on the Buehring farm. This eagle, as was later determined, was shot by a 32 caliber rifle bullet, which entered the back and came out below the breast without touching a vital organ. It was an old bird that weighed but little over eight pounds, and it had gone a long distance probably after it was struck. As in the former case, the female, which to my knowledge has had four different mates, namely in 1924, 1925, 1928, and 1931, left the region, and after an absence of fourteen weeks returned with a new protector on February 17, 1931. Together they resumed work at nest No. 6, first occupied in 1927, and from which they successfully reared a brood in the present year (1932). Had the female, instead of the male, been the victim, in such a case, I think it probable that he would have remained, taken on the duties at the nest, if there were any, and waited for a possible mate to enter his territory. This might depend, however, upon the strength of association which the male bird had formed with neighborhood and nest.

3. Building and Refitting the Nest.

Two nests have been built at Vermilion since this work was undertaken, in March, 1925, and in the winter and spring of 1927.

On the day after the destruction of their masterpiece in the former year both eagles were flying about the grove, and, as might have been expected, in a state of great excitement. As their screams resounded among the leafless trees they even ventured to fly down in a menacing way at people standing by the great pile of loam and faggots, which represented the ruins of their old home. They were also seen to alight in the tops of the tallest trees, as if in search of a

[2] By Mr. Edward Cleaver, through whose aid and that of Mr. Moses Ranney, the bird's body was obtained for the preservation of its skin.

place to rebuild. The new nest was actually begun ten days after the downfall in the truncated top of a great oak, upwards of four hundred feet to the southeast of their former nest-tree, and in what was probably the oldest denizen of the grove, for its trunk, when afterwards cut for lumber, showed three hundred and twenty-five rings of annual growth. Neither they nor their observing neighbors could then have foreseen that the spreading arms of this aged monarch were but hollow reeds which a storm would soon rend asunder.

On March 21 both birds were active in gathering sticks, mainly off the ground, and the following day was one of even more strenuous labor when one of the birds was often seen standing on the chosen site, receiving and placing the sticks, or treading down the straw, which were brought in the talons of the mate; but all this action stopped when any one moved up to their tree for a closer view. After the third day their building impetus slackened, and by the end of the fourth the work of construction was virtually completed. The new nest appeared to be about five feet in diameter and four feet tall, but, as the sequel showed, it was fortunate that no attempt was made to reach it and apply the measuring tape.

As already noticed this tree, which was ideal from our point of view, proved unfortunate for all concerned, for the main supporting branch was a fragile shell; and in a storm of May 18, 1926, the entire tree-top was sent crashing to the ground with nest, eaglets and all. The heart of the leader had been invaded by the larvae of a beetle, and successive broods of the insect had gnawed away and reduced to powder the foundations of this new castle of the kings of the air.

In mild seasons the Vermilion eagles begin to rebuild or refit their old eyrie in the first days of February, or, as we might say, they build a 'new nest' atop of the old, for the building impulses are purely instinctive, and the eagles' eyrie is virtually a composite affair, being made up of the consolidated increments of as many years as it has seen service. In winters severe enough to cut off their usual sources of food, and to prolong their absence from their customary haunts, the seasonal building activity may be delayed until the first of March, but with both birds working this labor can be performed in a few hours or days.

After from ten to twelve weeks of daily use the top of the eyrie is apt to be trodden flat, its surrounding sticks scattered and its straw bedding ground to powder. The old eagles in each following year build a new rampart of sticks, about a foot high, and fill up the intervening area with a thick layer of dead grass or straw. This building fever is apt to recur with diminishing force during the first weeks after the young are hatched, and their ardor gradually wanes until it is finally satisfied by bringing only an occasional stick, a wisp of dry grass, or a spray of oak leaves or of pine. Whole stalks of field corn, and often still bearing their yellow ears, were commonly a late addition, and all the more noticeable when draped over the sides of the nest. A farmer who was working in his field at the back of the tower said that on February first of that year an eagle came down within two rods of where he was standing, seized a stalk of his corn and bore it away; and a number of years ago an eagle was seen at Vermilion by one of my students making for its nest with twenty-five or more feet of rope dangling from its talons.

On a number of occasions I have seen one of the eagles, presumably the male, after coming to the nest, take a stick in his bill, carry it a few steps and then lay it down again. This, no doubt, represents a kind of activity which Siewert frequently noticed in his Screaming Eagles, with whom division of labor is much more sharply defined than in the American birds. What he calls 'decoration' of the nest, or bringing occasional branches of pine, fir and birch to line the eyrie or to bed the eggs, has its counterpart in the actions of our birds which I have described in an earlier paper. No doubt they represent, as already noticed, an aftermath of the building instinct,—the last feeble movements of the 'pendulum' before it settles to rest. Where this instinct of building is stronger than that of either brooding or feeding the young, the mere sight of the usual nesting materials, whether at the eyrie or away from it, may be the only stimulus necessary to arouse it. If in the forest, the eagle may break off a branch, and perhaps let it fall, without any concern over the usefulness of its actions,—and this, one of Siewert's Screaming Eagles was actually seen to do. Similarly at the nest the stick may be seized, but only to be quickly dropped. This is what Siewert would call 'symbolical' nest-building, but the bird may rise above such symbolical behavior to actual nest-build-

ing, as when it not only gathers the stick or the stubble, but places them on the nest. Whenever such an act serves to decorate, refresh, cool, or build up the eyrie, the result is purely incidental, for purpose and understanding clearly can have no part in it.

The most extensive rebuilding or refurbishing of the nest, which I noticed at Vermilion began on about April 25, when the young were in their third week, and lasted three or four days. It began by the addition of an occasional faggot and culminated in the bringing of several bushels of dead grass. Towards noon on April 28 of that year, as I was preparing to leave the tent, the male eagle sailed in with a great bunch of brown grass in his talons and trailing, in a smart breeze under his body. Upon seeing me on the ladder he wheeled about and flew to the tall tree perch where sat his mate. In making the difficult landing most of his precious load floated off on the wind, but he held on to the remnant and probably delivered it at the eyrie as soon as I was out of the grove.

4. *Contents of the Great Nest.*

In August, 1925, a report was broadcast that, according to complaints of farmers in Brownhelm and vicinity the Vermilion eagles were committing unheard of depredations, and were destroying large numbers of chickens, turkeys, and even lambs. An investigation was immediately ordered by the Fish and Game Commission of Ohio, and it was feared that, if the charges were sustained in any considerable degree, the lives of these outstanding birds might be declared forfeit to the State, since the eagle is a bird of prey, and although our national emblem, it does not, I am sorry to say, as yet enjoy the protection of federal statutes. It is, however, a migratory bird, in most parts of the United States, and on that ground alone it can rightfully and legally claim the protection of the National Government, and in my opinion it should receive it.

Friends of our rapidly vanishing wild life became deeply interested in the fate of these eagles, and offers of coöperation and support in seeing full justice done in their case, came from many parts of the state and nation. I was convinced that, so far as these particular eagles were concerned, as so often happens, the reports had been grossly exaggerated, and that their destruction would be a lasting disgrace. It was suggested that, if necessary, a fund should be raised

EAGLE FAMILY AT GREAT NEST, WHILE ENGAGED IN FEEDING THEIR YOUNG. BOTH BIRDS SUDDENLY COME TO ATTENTION. FEMALE, WHICH IS THE LARGER, AT THE RIGHT. APRIL 28, 1924.

to indemnify all persons for genuine losses incurred; and one of our Ohio congressmen, who declared that "to have these eagles captured or destroyed would be a tragedy," offered to contribute to such a cause. The president of the Rock River Chapter of the Isaac Walton League of America, and the executive secretary of this organization, representing one hundred and twelve Chapters throughout the country, were prompt in offering their aid, the latter saying that "even though the eagles might have carried off a lamb or two, it would be far better to reimburse any for the losses claimed than to destroy these interesting and beautiful birds."

Not only was it shown that the reports of the losses incurred had been greatly magnified, but I was able to offer in support the results of direct observations upon the food-habits of these particular birds, as well as the strong and impersonal testimony afforded by the contents of the Great Eyrie itself. This had preserved the solid remnants of these eagles' repasts, and gave us a remarkable cross-section of their food-habits for upwards of a third of a century.

The dark voluminous loam of the solid core of this nest was sprinkled with feathers, and with the scales and bones of fishes, the eagles' principal food; and we did not find a single bone of a turkey, nor of any domestic fowl larger than a chicken, and not a bone of a mammal greater than a rabbit. These eagles had never been known to systematically clear away the carcasses of their prey, but they had often been seen to cover them up, so it seemed that the contents of their eyrie spoke with authority and told the truth.

It is to the solid core of this nest that I wish to call particular attention, since it concealed the bones and other remains of innumerable aquiline dinners. Just as the ashes and soil on the floors of caverns, once occupied by palaeolithic man, have preserved not only his implements, but have yielded a rich store of the bony fragments of all those animals which he habitually hunted for food, so it had been with these eagles. Like primitive man, too indifferent to sweep house, or content merely to refresh it with occasional layers of straw or stubble, their eyrie had become in time a sodden mass of vegetable decay, in which bones, scales, feathers, and hair had been preserved for a long period.

Here, in brief, is what was found in the ruins of the eyrie immedi-

ately after its destruction, the principal objects[1] of which were tabulated, and are here named in the order of their general interest:

(1). Bones of an eagle, a juvenal that had possibly been killed at the nest, but representing a part only of the entire skeleton. Those actually recovered from the shoulder, wing and leg of the left side, show that they came from a young bird of adult proportions, the ulna of the wing measuring 9¼ inches.

(2). Bones and feathers of the domestic fowl, but in numbers small relatively to those of fishes.

(3). Bones and feathers of a number of wild birds, including the Crow, Grebe and possibly a Plover.

(4). Bones of small mammals, as the rabbit, muskrat, rat and squirrel.

(5). The entire central mass was liberally sprinkled with the skeletal remains of fishes of many kinds, representing those species which are commonly brought in alive from Lake Erie or are found washed up on its shores.

(6). Miscellaneous objects, such as buttons, small pebbles, worn fragments of grass or porcelain, which might have come from the gizzards of fowl, or from turf and stubble gathered along the line of a beach. Two celluloid poultry markers, one still encircling the shank-bone of a chicken, on which it had been placed by its owner many years before, were also turned up, together with old egg-shells from which eaglets had once emerged, as well as those of the new eggs which were shattered in the fall.

On the Great Eyrie, as well as in nest No. 6, which succeeded it, lay sprays of the white pine, for which and other kinds of foliage, all eagles, for some unknown reason, seem to have a strong predilection. The ruins of this last nest contained, besides the remains of fish and domestic fowl, the feathers of the Flicker, Meadowlark, Robin, Bob-white and Crow.

The Bald Eagle thrives in the extensive marsh region of Ottawa county near the mouth of the Sandusky River, where the trapping of muskrats is a lucrative industry; and the eagles levy toll from both the muskrats and the trappers, no less than fourteen steel traps, according to report, having been recovered from the ruins of a nest that was demolished in that section not long ago.

[1] These are now a part of the Eagle Exhibit at The Cleveland Museum of Natural History.

A nest in the same region in the township of Ripley, near Urlin, and four miles northeast of Fremont, on the farm of Urban A. Meyer, is remarkable for having been built in late October and early November, or four months before the usual nesting activity of eagles in those parts. It stands in a pin oak, but fourteen inches in diameter at base, at a height of perhaps fifty feet, on the edge of a cornfield and not over three hundred feet from a travelled road. When I first visited the nest on July 10, 1927, it contained but one young eagle, the only one reared that year, and then about ready for flight. Mr. Meyer had seen one of the old birds in June fly over a clover field and gather up all the 'fodder' it could hold in its talons, and when he saw them collecting alfalfa in the same way, he was convinced that they were going to have 'greens for dinner.' No doubt that young eagles, which I have known to swallow considerable amounts of excelsior on the floor of their cage, in playing with such green 'fodder' do actually eat a little of it now and then, but I have never seen them welcome it as they do their usual fare. When building their nest he saw the eagles take sticks from the ground, and also fly against a dead branch and seizing it in their talons, break it off without descending to the ground. The eagles had been seen daily in the neighborhood up to January 5, when they were absent for about a fortnight, their usual habit, when not engaged with young, being to leave for the lake at about nine o'clock in the morning and to return towards four in the afternoon. One day a third eagle, probably an unmated bird, joined them but when they reached the nest, the pair fought the intruder and drove it off at high speed.

5. Egg-laying and Incubation.

In 1925 the eggs of our eagles were laid before March 10, for on the night of that day the nest crashed in a storm and fragments of the shattered eggs showed plainly that incubation was not far advanced.

My estimates for the laying of the eggs in other years, which are based mainly on behavior, are not to be regarded as accurate, and may be in error two days either way. They vary from March 6 to the end of April. The eggs are externally dull white, but the shells are light blue on the inside. They vary in number from 1 to 4, and

are about the size of those of the domestic goose, one set of two from Florida (see note at beginning of paper) measuring 2.50 x 2.12 and 2.62 x 2.06 inches. Two may be taken as the average number, but two sets of four eggs have been reported from Canada, and two other sets of the same number are known to me, one in the admirable collection of Mr. Herbert A. Brandt, and the other from a Pelée Island nest, was taken for experimental purposes in 1929. The eggs are not always or commonly laid in daily succession, and judging from our incubation experiments and the relative sizes of the eaglets at the time of the hatching of the last egg, an interval of three, four or more days between successive layings may sometimes occur. Usually, and probably always, in freezing weather, incubation begins with the appearance of the first egg, and lasted at Vermilion, on the average, from 34–35 days. The Golden Eagle is said by Seton Gordon[1] to require full five weeks to bring her two or three eggs to the hatching point, but in Dr. F. A. Crandall's Bald Eagles, which bred in confinement at the Buffalo Zoological Garden the incubation time varied from 31 to 46½ days. Siewert studied but one nest of the Schreiadler in East Prussia, and as the second egg (laid May 11) proved addle, but a single eaglet was reared. The incubation time, or the time which elapsed from the laying to the hatching of the first egg (May 1–June 13), was 43 days; and it should be added that although the brooding pauses were numerous and long at both the beginning and end of this period, they did not have any injurious effect upon the embryonic development.

Three eggs were laid at Vermilion in 1924 and 1926, and two only in other years, but it is probably a rare event for more than two eagles to be reared. In three instances known to me in which a bird lost its eggs through robbery or the hazard of storms, early in the season, another set had been forthcoming and in the same nest when this was intact. One bird robbed of her three eggs repeated with three, while another losing four came back with two.

The eagle is a notorious place-holder, and the tenacity with which certain individuals cling to their home and chosen hunting grounds is astonishing. There is the outstanding case of these Vermilion birds holding to the same territory for nearly a century,

[1] See "Days with the Golden Eagle," London, 1927.

in spite of all the reverses they have suffered, or any interruptions of their domestic affairs by the building of our towers, which were gradually advanced until they stood less than forty feet from their doors. Quite as exceptional, possibly, is the following case: from a certain Canadian nest two young eagles were taken when in gray down, in 1929, and reared to adult size; four, and later two eggs were taken from the same nest in the spring of the following year. The same pair was again robbed of a first set of three eggs in March, 1931, but how many, if any, then followed I did not learn.

Notwithstanding such occurrences, it must be remembered that individual variability is a factor always to be reckoned with, and I have known a nest and neighborhood to be abandoned when once the eggs failed to hatch, another site at Kelley Island, Ohio, to be deserted when a storm wrecked the nest, and still another nest on the same island to be reoccupied after it had been vacant for a number of years.

6. Care of the Eggs in Incubation.

On April 19, 1926, when, according to my estimate, the eggs were close to the hatching point, I set one of the tents on the ground two hundred feet from the eagles' tree, in order to watch closely the activities at the nest without disturbing the actors. When we were set for observation at 11:20 A. M., the male eagle was standing guard on one of his tree-perches, while his mate was on the nest. One hour later the male suddenly left and moved off to the southeast. At about this time also the mother eagle began ducking her head and stirring up the nest-materials in lively fashion. She was covering her eggs, and in a few minutes rose, shook her up-lifted wings, and was off in the direction her mate had but just taken, but quickly returned. She alighted on a side of the nest, and stood there for a moment as if to make sure that all was well, and then, flying in the same direction as before was soon out of sight. Absent this time exactly two minutes, she returned direct to the eyrie, and half a minute later was followed by the mate. The female eagle then walked deliberately to the middle of the eyrie, while the male stood on one side, and began at once to make the grass and dirt fly as she uncovered her treasures, pausing only to shake her bill and mouth clear of any annoying dust-particles. Then, as she gave a

sharp chitter the male walked up with alacrity and took his turn at brooding the eggs.

The female thus relieved at 12:41 P. M., spent a short time in walking around and nibbling at scraps of food in the nest, before taking a nearby tree-perch.

When he had brooded for half an hour, the male eagle stood up, and after picking for some minutes at objects beneath him, settled down again. Presently a chitter, but now coming from him, was heard, precisely like the signal which had been previously given by his mate. The female, who at the moment was facing the wind and away from the nest, heard his sign, but, without changing her position, turned her head around and looked straight at the nest: otherwise she did not move. The male rose to his toes again, and having made further adjustments of the nesting materials, settled down, and so low that only his yellow bill could be seen through the circular rampart of sticks.

Now, at 2:37 P. M., the female suddenly left her perch, went off in the same direction as formerly, and after a stay of three minutes, came back to the nest, from which she had been absent nearly two hours and took a position at its side. She stood there for twenty-five minutes without making any move, but once or twice we heard a mild chitter, which might have come from her, but if so, it evoked no response in her sitting mate.

The male eagle took his turn off duty at 3:04 P. M., or after having brooded for two hours and twenty-four minutes, and a moment later was on the tree-perch which he habitually used. The female then walked slowly and cautiously to her station over the eggs. On this shift the male was absent one hour and twenty-three minutes, but returned to one of the upright branches of their nest-tree, and presently with a signalling chitter dropped to the eyrie. The female was off in a minute and at once flew out over Lake Erie, while the male, after searching for stray crumbs of food again took his place over the eggs. He was still brooding when we closed the tent at 4:45 P. M., and the female, who had returned, was on her former perch.

The preceding notes have been given in circumstantial detail in order to show how complete coöperation in the matter of brooding the eggs may be, when behavior is free, and how closely a fairly

definite formula may be followed when no disturbing elements intervene. In the five or six hours during which the activities of these birds were kept under close observation, no food was brought to the nest, which tended to confirm our inference that no young had yet appeared. In that season of 1926 incubation, according to my estimate, lasted thirty-five days.

7. *Enemies of the Eagles' Eggs.*

Like all 'birds of prey,' the eagle suffers much annoyance from many other members of the bird-world, in which he is anything but popular. The crow hates the eagle, and the eagle despises the crow, but to say that the eagle *fears* the crow, or hawks, or the little kingbirds, or the more diminutive gnatcatchers, or any other who may pester him at times, or assail his hours of repose, is altogether irrational.

When the eagle is too much bored or preoccupied, too lazy, or not in a pugnacious mood, and when there are no eggs or young to be defended, he may suffer almost any indignity, short of a direct attack, but the impudence of a tormentor can be carried too far, and all counterfeit marks of fear can be suddenly laid aside.

A singular incident, which illustrates what has just been said, occurred during a recent sojourn at Vermilion. The mother eagle had but just dropped a fish on the eyrie, and taken a favorite perch one hundred feet from our tower and from a Blue Gray Gnatcatcher's nest that was affixed to the lofty branch of an elm just below the tent. The eagle was beset by this pair of indignant gnatcatchers, which buzzed about her like so many angry wasps. I could see one of the eagle's wings drop, as she started to relax, but there was no peace for the tired bird, and after ducking her head time and again at the thrusts of her pigmy assailants, she left this perch and went to one farther away in the forest. Those fiery little gnatcatchers, which do not much exceed a hummingbird in size, had just brought out a brood close to our tower, and were plainly outraged that their big neighbor should have the temerity to trespass on their domains. It was evident that the eagle, like the patient ox, found it easier to seek another refuge in the shade than to drive the 'flies' away.

From four to five weeks of unremitting watchfulness, conceal-

ment or strong arm methods for keeping the rascally crow and other potential enemies at a safe distance, is the price the eagles must pay to insure the safety of their two or three large and conspicuous eggs. When the incubational strain is over, though ever solicitous of the welfare of their tender young, the eagles allow themselves a little more freedom. At such a time they would sometimes leave the nest together, if only for a turn over the woods, or a brief sortie to the shore of the lake.

Crows caused the eagles more annoyance during this critical period of their domestic affairs than all other thievish neighbors combined. My notes are prolific in observations relating to these impertinent rascals, and go to show that the attitude of the eagles towards them varies very considerably with the season. The crows may often clamor and trail after the 'king of birds' to their heart's content during most of the year, but their folly will not be tolerated during the danger period of eggs or young. Heckling the eagle may be great sport for the crow at other times, but it is a perilous business then.

One day the mother eagle, when brooding her callow young, then in their natal down, was surprised by a crow that flew directly over her, but she had probably only sensed some object above her in the air. She was on her toes in a flash, and with wings raised was prepared for any emergency. The apparition vanished in a moment, and perhaps before its true nature was clearly perceived, for the old eagle dropped her wings and settled to her brooding again.

When, upon my entering the grove on the morning of March 18, a flock of crows came flying over, and spied the male eagle taking his ease on a tree-perch, the whole company set up a great clamor, as if to warn the countryside of the presence of a common enemy; but this was a time when our eagle had no stomach for trifling, since not far away sat his mate probably on her first egg that may have been laid that very morning. He went after them at once and at full tilt, driving now at one, now at another, until he had put them all high up in the air, and he chased the stragglers until all were well out of his neighborhood. At that period every crow that ventured near, was driven helter skelter from the vicinity, but I noticed that when it was too hard pressed it would often take refuge by diving to the ground. Later in the season any crow could

FEMALE EAGLE STANDS ON FISH, TEARING OFF PIECES AND PASSING THEM TO EAGLET ON RIGHT. THE OTHER EAGLET SEEMS TO BE SATIATED. A FISH MINUS HEAD LIES IN THE FOREGROUND.

trail after the eagle, or even pester him on his perch with much greater impunity, but at the first sign of resentment it was off. It is true that the eagle sometimes appeared to be nervous when the crows were above him, but the moment he ascended and tried to drop on them, they beat a hurried retreat to the ground.

A Herring Gull, one day, as related to me by the farmer of the adjacent property, in flying low over the woods, passed directly above the eagles' nest, and one of the big birds gave immediate chase, the gull mounting rapidly with the eagle close on its heels. The eagle was perhaps only doing to the gull what the gnatcatcher had tried to do to him, for he seemed more interested in driving off the intruder than in overtaking him, and after both had reached a considerable height, the eagle returned to his eyrie.

The eagles seemed rather indifferent to hawks, whether large or small, and sometimes, when one appeared, they would only chitter or work their mandibles, as if muttering to themselves; but when in a different mood they would go after the hawk and give it a long chase. The lunges of the hawk at the eagle were always feints, for he never came close, but at the first menacing stroke of his master the game for the hawk was up, and it made its escape as best it could. On a certain occasion when a Cooper's Hawk came into the eagles' territory, and darted towards one of the birds at rest on a perch, the response was only a chitter. The plucky hawk then made another feint at the eagle, and, as if to vindicate its independence, encircled the eyrie before making off.

(*to be concluded.*)

Cleveland Heights, Ohio.

NOTES ON SOME NEOTROPICAL GAME-BIRDS.

BY C. E. HELLMAYR AND H. B. CONOVER.

FOR some years past we have paid considerable attention to investigations of the taxonomy and natural affinities of various neotropical game-birds, principally in connection with material acquired by the junior author for his collection now on deposit in Field Museum of Natural History, and hope to publish the results of our studies in a series of papers, of which the present one dealing with some species of the genus *Penelope* forms the first instalment. For the loan of material used in its preparation we wish to express our gratitude to Dr. F. M. Chapman and Mr. J. T. Zimmer, of the American Museum of Natural History, New York, and to Mr. W. E. Clyde Todd, of the Carnegie Museum, Pittsburgh. We are also under obligations to the authorities of the British Museum (Natural History) and the Museum d'Histoire Naturelle, of Paris, for the opportunity afforded the senior author to examine certain types preserved in these institutions.

Penelope argyrotis.

This group is immediately recognizable among its affines by having the rectrices largely tipped with cinnamon. It comprises three races:

(a) **P. argyrotis argyrotis** (BONAPARTE).

Pipile argyrotis Bonaparte, Compt. Rend. Acad. Sci. Paris, *42*, p. 875, 1856—Caracas (types in Paris Museum).

Penelope lichtensteinii Gray, P. Z. S. Lond., *28*, p. 269, 1860—Venezuela (type in British Museum).

Penelope montana (Lichtenstein Ms.) Reichenbach[1] Tauben, p. 151, 1862—Venezuela (type in British Museum).

This form inhabits the subtropical zone of northern Venezuela, from the Caracas region[2] west to Mérida, and apparently ranges even into the Eastern Andes of Colombia.[3]

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[1] The name *Penelope montana* was first published by Bonaparte (Compt. Rend. Acad. Sci. Paris, *42*, p. 877, 1856), but as an absolute *nomen nudum*.

[2] Beebe (Zoologica, *1*, p. 72, 1909) lists the species from Caño Colorado, in the Orinoco delta. We strongly doubt the correctness of this identification, however.

[3] A "Bogotá" specimen has been recorded by Sclater and Salvin (P. Z. S. Lond., 1870, p. 528) and Ogilvie-Grant (Cat. Bds. Brit. Mus., *22*, p. 501, 1893). Todd

Specimens have been examined from Caracas; Galipán, Cerro del Avila, Dept. Federal; La Cumbre de Valencia, Carabobo; and La Azulita, Mérida.

Doubts have been cast on the applicability of Bonaparte's name "*argyrotis*," since the diagnosis, "semblable à *P. marail*, mais la face encadrèe de blanc mat, plus ètendu et plus brillant sur la région des oreilles," was absolutely inadequate for its proper identification. The senior author has carefully examined at Paris the two original examples, both collected by Levraud in the vicinity of Caracas, and found them to agree with other birds from northern Venezuela in having the rectrices broadly tipped with cinnamon, the forehead, superciliaries and malar region strongly edged with silvery white, and the feathers of the upper back, wing coverts, foreneck and breast laterally margined with white. The pertinence of *P. argyrotis* to the present race is thus established beyond doubt.

(b) **P. argyrotis colombiana** TODD.

Penelope colombiana Todd, Anns. Carnegie Mus., *8*, p. 213, 1912—Las Taguas, Santa Marta region, Colombia (type in Carnegie Museum); idem and Carriker, l. c., *14*, p. 173, pl. 2, 1922—Santa Marta region.

Closely similar to *P. a. argyrotis*, but feathers of pileum narrower, apically slightly attenuated, dull grayish bronze and for their entire length very conspicuously edged with grayish white on both webs, whereas in the typical form the upper part of the head is decidedly rufescent (buffy) brown with broad, bluntly rounded feathers and white edges only on forehead and anterior crown. The silvery white superciliary streak so well pronounced in *P. a. argyrotis* is merely suggested by grayish margins; the malar stripe, silvery white in the Venezuelan birds, is dull brownish, intermixed with obsolete ashy grayish edges; hind neck and upper back are more profusely marked with buffy white (instead of pure white) lateral margins; the cinnamon tips to the rectrices more extensive and darker in tone, etc.

This well marked form, of which we have examined a good series, is peculiar to the Santa Marta district, being chiefly found in the subtropical zone between 3,000 and 6,000 feet.

(Anns. Carnegie Mus., *14*, p. 174, 1922) also states that birds from the region to the southward (of Santa Marta) pertain to typical *argyrotis*. The status of the representative of this group in northeastern Venezuela (Neveré, State of Sucre) is uncertain (cf. Chapman, Amer. Mus. Novit., *191*, p. 6, 1925).

(c) **Penelope argyrotis barbata** CHAPMAN.

Penelope barbata Chapman, Amer. Mus. Nov., *18*, p. 3, 1921—Tarajuacocha, Zaruma-Zuraguro Trail, Cordillera de Chilla, Prov. del Oro, Ecuador (type in American Museum of Natural History, New York).

Though readily distinguished by its feathered upper throat, the restriction of the grayish rather than white markings both above and below, and the darker general coloration, we cannot see in this bird anything but a strongly characterized race of *P. argyrotis*, which it represents in the subtropical and humid temperate zone of western Ecuador.[1]

In addition to the type, we have seen two specimens from San Lucas in the collection of the British Museum.

Penelope montagnii

P. montagnii and *P. sclateri*, heretofore regarded as specifically different, constitute a single natural unit. While there seems to be a wide gap between the Colombian bird with its heavily feathered throat and dull coloration and the almost bare-throated, bright-colored Bolivian Guan, the Peruvian form, for which we provisionally adopt the name *plumosa*, is so exactly intermediate in its characters that the only logical conclusion leads to the specific association of the two groups.

The five races, into which this widely distributed species is divisible, are diffused over the upper subtropical and humid temperate zones of the Andes from western Venezuela and Colombia south to Bolivia.

(a) **P. montagnii montagnii** (BONAPARTE).

Ortalida montagnii Bonaparte, Compt. Rend. Acad. Sci. Paris, *42*, p. 875, 1856—"Nouvelle Grenade" = Colombia (type in Paris Museum).

The subspecific characters of this form are most typically developed in birds from the East Colombian Andes and the adjoining parts of Venezuela. The whole throat—with the sole exception of a small bare spot in the middle of the foreneck—is covered with dense soft feathers, which, like those on the sides of head and neck, are

[1] It probably ranges into northern Peru. Taczanowski's records of "*P. sclateri*" from Tambillo and Tamiapampa (P. Z. S. Lond., 1879, p. 243; 1882, p. 48) may refer to *P. a. barbata*, as is suggested by his subsequent note (in Orn. Pérou, *3*, p. 269, 1886) that these North Peruvian examples differ by having long rufescent tips to the rectrices and the white lateral margins restricted to the forehead.

broadly margined all round with ashy gray; the superciliary region is similarly marked; the feathers of forehead and crown are laterally edged with gray; rump and upper tail coverts bright tawny more or less distinctly barred with dusky, this rufous area abruptly contrasted with the bronze brown of the back; lower breast and abdomen tawny or ochraceous-tawny, also more or less barred with dusky.

The type, which the senior author has carefully compared in the French National Collection, agrees in all essential particulars with specimens from the Eastern Andes of Colombia. It formed part of a series of native Bogotá skins presented by M. Lewy in 1850. Birds from the Mérida region of Venezuela are perfectly similar.

In the Central and Western Andes of Colombia, however, most of the characters specified above are subject to much variation, and in the extent of feathering on the throat as well as in the amount of gray edging on the head, the inhabitants of these parts of the Andes occupy an intermediate position between typical *montagnii* and the West Ecuadorian form. We have seen series from the Western Andes (Sancudo and La Leonera, Caldas) and the Central Cordillera (Santa Isabel, Quindio Andes) and also two skins from the sources of the Rio Patia (Almaguer and Valle de las Pappas). Among these thirteen specimens there are only four, two each from Caldas (La Leonera) and Santa Isabel, that may be termed typical *montagnii*. Another adult from the latter locality differs by having the bare jugular patch much larger, at the expense of the throat-feathering, which, though similar in structure to East Andean birds, shows mere traces of grayish edges. Three individuals from Caldas (Sancudo), one from Santa Isabel, and a female from Valle de las Pappas form the passage to the West Ecuadorian race by the reduction of the grayish margins in the superciliary region and on the sides of the head, and the Santa Isabel bird, furthermore, approaches it by having but a few olive grayish edges on forehead and anterior crown. Even closer are another adult from Santa Isabel and a male from Almaguer, which can only be distinguished from West Ecuadorian birds by the presence of a few scattered grayish tips on the lower edge of the feathered gular area. The belly is generally duller, less rufescent, though several West and Central Andean specimens are just as rufous-bellied as those from the Bogotá region.

Material examined.—Venezuela: La Cuchilla, Mérida, 4; Rio Mucujón, Mérida, 3.—Colombia: Páramo de Tamá, Santander, 2; "Bogotá," 2; Subia, Cundinamarca, 3; El Piñon, above Fusugasugá, 1; Santa Isabel, Quindio Andes, 6; Almaguer, Central Andes, Cauca, 1; Valle de las Pappas, Central Andes, Huila, 1; Sancudo, Western Andes, Caldas, 3; La Leonera, Western Andes, Caldas, 2.

(b) **P. montagnii atrogularis** subsp. nov.

Type from Alaspungo, Western Ecuador, in Collection of H. B. Conover, No. 7397. Adult male. Nov. 5, 1929. Olalla and Sons.

Adult.—Nearest to *P. m. montagnii*, but on average smaller; only chin and upper throat with scant bristle-like black feathering without any gray; malar region, auriculars, and superciliary region with mere traces of grayish edges; forehead only with faint lateral fringes of gray; posterior under parts less tawny; apical half of upper mandible (beyond nasal fossa) horn brown, not reddish.

Wing, 225–245; tail, 210–220, once 235; bill, 27–30 mm.

Range.—Subtropical and humid temperate zones of western Ecuador.

Remarks.—Thirteen specimens from various localities on the western slope of the Ecuadorian Andes, though connected by intergrades with *P. m. montagnii* as explained under the preceding heading, are so uniform *inter se* and present such marked divergencies from a series of East Colombian and Venezuelan skins that we have no alternative but to separate them subspecifically. The most striking character consists of the much scantier, bristle-like feathering of the throat, this area being at the same time less extensive and leaving consequently a much larger bare space on the median and lower portion of the gular region. The color of this feathered tract is dull black and shows at best—in two or three individuals—a few tiny grayish tips near its lower end. The ashy gray edges on sides of head and neck, which form such a conspicuous feature in typical *montagnii*, are either wholly absent or barely suggested by some scattered obsolete dull grayish fringes, while there are only narrow brownish or dull grayish margins on the forehead of the crown. Breast and abdomen are as a rule duller, less rufescent than in *montagnii*, though sometimes just as bright rufous. The apical half of the maxilla is never reddish yellow, but decidedly horn

brown, in two (possibly immature) birds blackish like the basal portion.

Material examined.—Western Ecuador: Alaspungo, 3; Aluguincho, 2; Huila, 1; Saloya, Prov. Pichincha, 3; Pucara, Prov. Pichincha, 1;[1] Lloa-Urabuco, Prov. Pichincha, 3.

(c) **P. montagnii brooki** CHUBB.

Penelope brooki Chubb, Bull. Brit. Orn. Cl., *38*, p. 5, 1917—Baeza, eastern Ecuador (type in British Museum).

This race resembles *P. m. atrogularis* in scant, bristle-like, uniform black feathering on chin and upper throat, but differs by duller (about auburn) rump, somewhat more bronzy, greenish rather than brownish back, and particularly by having like typical *montagnii*, wide ashy gray edges on the sides of the head and neck. The feathers of the pileum are broadly margined laterally with whitish gray down to the upper back, and the whitish edges on foreneck and breast are even more prominent than in *montagnii*. The apical half of the maxilla is pale yellow abruptly contrasted with the blackish basal portion. Dimensions about the same as in *P. m. atrogularis*.

P. m. brooki is confined to eastern Ecuador. In addition to three adults from Cuyuja in the Conover Collection, one of us has examined two, including the type, from Baeza in the British Museum.

(d) **P. montagnii plumosa** BERLEPSCH AND STOLZMANN.

Penelope sclateri plumosa Berlepsch and Stolzmann, P. Z. S. Lond., 1902, II, p. 45, 1902—Maraynioc, Pariayacu, Dept. Junín, Peru (type in Warsaw Museum).

Birds from northern Peru are about half-way between *montagnii*, of eastern Colombia and Merida, and *sclateri*, of Bolivia. They differ from *montagnii* and the two Ecuadorian races by wholly blackish upper mandible; much more prominent, silvery white instead of grayish edges on pileum, hindneck and superciliary region; the possession of very distinct, silvery white lateral margins on the mantle and upper wing coverts, and more conspicuous, sil-

[1] There is also in the Conover Collection an adult female from this locality which is a pure albino except for traces of rufous on the rump. The forehead and feathering on the upper throat are dull blackish, but this may be stain.

very white rather than grayish white markings on foreneck and breast, which moreover, do not meet at the tip, thus producing a more streaked effect. The rufous of the belly is brighter than in *montagnii*, though not so intense as in *sclateri*. From the latter they may be distinguished by having the chin and throat densely covered with soft fully-developed, ashy gray, centrally dusky-streaked feathers as in *montagnii*, whereas the Bolivian form shows only scant blackish "bristles" on the upper portion of the otherwise bare throat. The bare space round the eye is less extensive, and the consequently broader feathered malar streak is edged with ashy gray as in *montagnii*, not with silvery white as in *sclateri*. Forehead, crown and superciliary region are as profusely margined with silvery white as in *sclateri*, but these markings extend unimpaired over nape, hindneck, and mantle, whereas in *sclateri* the posterior part of the crown and hindneck are uniform bronze green. On foreneck and breast the white lateral margins are likewise much broader and more numerous, and the abdomen is decidedly duller rufescent than in the Bolivian form. The general coloration of the body plumage is brownish bronze as in *montagnii*, much less greenish than in *sclateri*.

Measurement.—Adult males: wing, 240–245; tail, 240; bill, 26–28.
Adult female: wing, 235; tail, 245; bill, 26.

This form appears to be distributed over the greater part of eastern Peru.[1] Field Museum has two ♂♂ ad., one ♀ juv. from ten miles east of Molino-pampa, and a single adult female from the mountains east of Balsas, in northern Peru, all collected by W. H. Osgood and M. P. Anderson in May and June, 1912. Chapman[2] records *P. m. plumosa* from as far south as Toronboy, Urubamba Valley, Dept. Cuzco.

Our specimens do not altogether agree with the (rather short) original description, and direct comparison with topotypical material seems advisable.

(e) **P. montagnii sclateri** GRAY.

Penelope sclateri Gray, P. Z. S. Lond., *28*, p. 270, 1860—Bolivia (type in British Museum).

[1] Taczanowski's records of *P. sclateri* from Tambillo and Tamiapampa, however, probably refer to some other species. Cf. the footnote to *P. argyrotis barbata*.

[2] Bull. U. S. Nat. Mus. *117*, p. 44, 1921.

This, the most southerly of the races of the group, differs from the others by much brighter bronze *green* dorsal surface, tail and breast; much more extensive bare space round the eye; naked throat and foreneck with "bristles" only on anterior portion; brighter tawny abdomen; more restricted tarsal feathering, hardly reaching beyond the heel-joint, etc.

There is some variation among the specimens before us, particularly with respect to the coloration of the rump, which is bright tawny chestnut strongly contrasted with the bronze green back in an adult bird from the Yungas of Cochabamba, but hardly more rufescent than the rest of the upper parts in a pair from Incachaca, Cochabamba. The type of *P. sclateri* collected by Thomas Bridges somewhere in Bolivia, which the senior author examined in the British Museum, agrees with the last-named variety.

P. m. sclateri is confined to western and central Bolivia.

Penelope purpurascens.

This group differs from the *P. montagnii* series by much greater dimensions, larger bill, much stronger as well as longer tarsi and toes, wholly bare throat and foreneck with merely some "bristles" on the chin, and much more extensive naked skin round the eye.

It comprises four races, its range extending from eastern Mexico south to western Ecuador and east to western Venezuela.

(a) **P. purpurascens purpurascens** WAGLER.

Penelope purpurascens Wagler, Isis, 1830, Heft 11, p. 1110, 1830—Mexico, probably State of Vera Cruz (type in Munich Museum).

The typical form is widely distributed in eastern and southern Mexico and Guatemala. Within this range we have been unable to find any local variation.

(b) **P. purpurascens aequatorialis** SALVADORI AND FESTA.[1]

Penelope aequatorialis Salvadori and Festa, Boll. Mus. Zool. Torino, *15*, No. 368, p. 38, 1900—Rio Peripa, western Ecuador (type in Turin Museum).

[1] This is the bird long known as *P. cristata*, a name inapplicable to the present species, as has been first pointed out by Chubb (Ibis, 1919, p. 16). *Meleagris cristata* Linnaeus (Syst. Nat., 12th ed., *1*, p. 269, 1766) is based on "Jacu-pema" of Marcgrave (Hist. Nat. Bras., p. 198), an incompletely described species of northeastern Brazil (possibly *P. jacucaca* Spix), and "The Quan or Guan" of Edwards (Nat. Hist. Bds., *1*, p. 13, pl. 13), from "one of the Sugar Islands in the West Indies," an utterly unrecognizable creature. The name must be dropped as unidentifiable.

This form may be distinguished from the preceding one by chestnut rump and upper tail coverts, rufous abdomen, and the absence of the white lateral edges on hindneck, mantle and upper wing coverts, not to mention several minor differences.

Specimens from Costa Rica, Panama, western Colombia (Chocó), and western Ecuador agree perfectly. All have the inner remiges bronze green with very little, if any, coppery gloss, and we suspect that Salvadori and Festa, when separating *P. aequatorialis* from "*P. cristata*" on account of greenish wings, used a wrongly identified specimen of some other form, possibly *P. p. perspicax*, for comparison.

P. p. aequatorialis is an exclusive inhabitant of the lower tropical zone, and its altitudinal range does not reach beyond 3,000 feet. Its distributional area extends from Nicaragua through Costa Rica and Panama south along the Pacific coast of Colombia to western Ecuador.

In addition to a series from Costa Rica and Panama we have examined one specimen from Colombia (Chocó) and four from Ecuador (Bulún, Prov. Esmeraldas; Santo Domingo de los Coronados; Rio Peripa; Bajo Verde, Prov. Guayas).

(c) **P. purpurascens perspicax** BANGS

Penelope perspicax Bangs, Proc. Biol. Soc. Wash., *24*, p. 187, 1911—San Luis, Bitaco Valley, Western Andes, Colombia (type in Museum of Comparative Zoology, Cambridge, Mass.).

Closely similar to *P. p. aequatorialis*, but smaller, and differing, besides, by coppery auburn instead of bronze green inner remiges, more brownish, less bronze green, foreneck and breast, and the presence of narrow grayish edges on the scapulars and upper wing coverts, these markings being but slightly suggested in some individuals of *P. p. aequatorialis*.

The coppery auburn coloration of the exposed surface of the inner wing-feathers is a very constant feature in six specimens of *P. p. perspicax*, and is not approached by any of the numerous skins of *P. p. aequatorialis*, although the latter form sometimes shows a slight brownish tinge on the wings. The central pair of tail-feathers is uniform coppery auburn like the secondaries in two examples (San Antonio and Miraflores), while in the four others

they are duller reddish brown with a sepia brown tone prevailing on the tip and along the shaft.

Every one of the six specimens has distinct grayish lateral margins on upper back, lesser, and median wing-coverts. These are, as a rule, absent in *aequatorialis*, but very nearly as well-marked in a female from Bajo Verde, Ecuador, while traces are discernible in another female from Ecuador (Santo Domingo) and two males from Guanacaste, Costa Rica.

P. p. perspicax obviously is a zonal representative of *P. p. aequatorialis*, and replaces it in the Subtropical Zone of the Cordilleras bordering the upper Cauca Valley, being found in the Western Andes (Pavas; San Luis, Bitaco Valley; San Antonio; Clementina) as well as on the western slope of the Central Andes (Salento, West Quindio Andes; Miraflores, east of Palmira). All the localities are at altitudes of 4,400 to 7,000 feet.

Material examined.—Colombia, Cauca: San Antonio (alt. 7,000 ft.), 2; Clementina, 1; Miraflores, east of Palmira (alt. 6,800 ft.), 1; Salento, West Quindio Andes (alt. 7,000 ft.), 2.

(d) **P. purpurascens brunnescens** subsp. nov.

Type from Rio Cogollo, Perija, Zulia, Venezuela, in Collection of H. B. Conover, No. 54. Adult female. Feb. 23, 1920. W. H. Osgood and H. B. Conover.

Adult.—Very similar to *P. p. aequatorialis*, but pileum and upper back decidedly less greenish, about dull medal bronze; central tail-feathers reddish brown or coppery auburn as in *P. p. perspicax;* foreneck and breast duller and more brownish with hardly any olive green gloss, so conspicuous in *P. p. aequatorialis*. Wing, 340–350; tail, 310–315; bill, 32–35 mm.

Range.—Tropical zone of extreme western Venezuela, in State of Zulia (Rio Guachi; Montañas de Palmar; Rio Cogollo, Perija), and adjoining section of Colombia (Santa Marta region), extending up the Magdalena Valley as far as La Candela, in the Subtropical Zone.

Remarks.—This hitherto unrecognized race is to a certain extent intermediate between *P. p. aequatorialis* and *P. p. perspicax*. It agrees with the former in lacking the coppery auburn color on the inner remiges and the grayish edges on mantle and upper wing

coverts, but resembles the latter in the duller brownish anterior lower parts and the reddish or coppery middle rectrices.

Three adult males from La Candela, head of the Magdalena Valley, are perfectly identical with the Venezuelan examples as to coloration, but have considerably longer wings and tail. This apparent difference may, however, disappear in a larger series, inasmuch as the sex of the only Venezuelan "male" collected by S. Briceno Gabaldon at Montañas de Palmar, is not absolutely reliable. If we are right in referring the La Candela birds to the present form—and we do not see how they can be separated—it would seem that *P. p. brunnescens*, which the junior author shot in the low tropical country south and west of Lake Maracaibo, Zulia, is not strictly limited to low-lying districts, but has rather a wide range in eastern Colombia, where it enters even the Subtropical Zone at the head of the Magdalena Valley.

Measurements.

	Wing	Tail
Three adult males from Costa Rica (*aequatorialis*)	378–392	360–375
Three adult females from Ecuador (*aequatorialis*)	340–370	325–380
Three adult males from Columbia (*perspicax*)	310–332	330
Three adult females from Colombia (*perspicax*)	295	300–315
Three adult males from La Candela (*brunnescens*)	360–382	360–380
Two adult females from Venezuela (*brunnescens*)	340, 345	315
Three adult males from Santa Marta (*brunnescens*)	355–360	320–340
Two adult females from Santa Marta (*brunnescens*)	335, 355	305, 340

Penelope jacquacu.[1]

This species is nearly allied to, and possibly conspecific with, the *P. purpurascens* group. Compared with the three South American races, it is about the size of *P. p. perspicax*, but has the rump and tail-coverts brownish or greenish bronze, not appreciably different from the color of the back, instead of rich chestnut strongly contrasted with the rest of the dorsal plumage. Besides, the lateral edges to the upper wing coverts and scapulars are wider as well as more whitish, while the under parts are more rufescent. The exposed surface of the inner wing-feathers is more as in *aequatoralis*, never coppery auburn. The extent of the naked skin on throat and sides of head is the same in the two species, and in structure of the

[1] Native name *jacquiaçu*.

crown-feathers typical *jacquacu* does not differ either from *aequatoralis* or *perspicax*. We admit that, considering the agreement in dimensions and morphological features, the color-differences are comparatively slight, and fully expect that, when more material becomes available, they will prove to be of not more than subspecific value.

P. jacquacu is divisible into two races, regarding which we wish to offer a few remarks.

(a) **P. jacquacu jacquacu** SPIX.

Penelope jacquacu Spix, Av. Bras. Sp. Nov., *2*, p. 52, pl. 68, 1825—"in sylvis flum. Solimoëns," Brazil (type in Munich Museum).

In the typical form the lengthened crown-feathers are broad and bluntly rounded at the tip, only the forehead, anterior crown, and superciliary region being narrowly edged with pale grayish.

It ranges from the Amazonian slope of the East Colombian Andes through Ecuador and Peru south to northern Bolivia (lower Beni), and through western Brazil east to the Rio Madeira.

Two specimens from the Rio Madeira (Salto do Girâo) are larger, thus approaching the next form, but typical in coloration.

We have examined a series from eastern Ecuador and various localities in Peru and western Brazil.

(b) **P. jacquacu speciosa** TODD.

Penelope speciosa Todd, Proc. Biol. Soc. Wash., *28*, p. 82, 1915—Rio Surutú, Prov. del Sara, Dept. Santa Cruz, Bolivia (type in Carnegie Museum).

This race differs by having the crown-feathers decidedly narrower, apically more pointed, and on both sides much more prominently edged with grayish white. The superciliary region is also more profusely margined with whitish; the white edges to the upper wing coverts are wider, the feathered malar stripe more or less intermixed with ashy gray.

Burmeister (P. Z. S. Lond., 1871, p. 701) appears to have been the first to apply to this well-marked form the name *P. boliviana* Reichenbach, when discussing some specimens received from Santa Cruz de la Sierra,[1] and Chapman (Bull. U. S. Nat. Mus., *117*, p. 44, 1921) is inclined to follow this nomenclature.

[1] Dabbene (Physis, *4*, p. 104, 1918; El Hornero, *1*, p. 180, 1918) has shown them to be referable to *P. speciosa*.

However, we are firmly convinced that Reichenbach[1] merely renamed typical *P. jacquacu*, as results from his description and figures, however wretched the latter are. By some unaccountable mistake various birds collected by the Polish naturalist J. Warscewicz during his travels in northern Peru, were labeled as coming from Bolivia,[2] and such doubtless also happened in the case of *P. boliviana*. The type unfortunately does not exist any longer in the Dresden Museum, as we are informed by Dr. A. Jacobi.

P. j. speciosa inhabits the Tropical Zone of eastern Bolivia (Rio Chimoré, north side of Sierra de Cochabamba; Buenavista, Rio Surutú, and Santa Cruz de la Sierra, Dept. Santa Cruz).

Material examined.—Bolivia: Rio Surutú (the type) 1; Buenavista, 3.

Penelope ortoni.

Penelope ortoni Salvin, Ibis, (3), *4*, p. 325, 1874—Mindo, western Ecuador (type in Vassar College, Poughkeepsie, N. Y.).

This is rather an isolated species, characterized by the complete absence of any rufescent tone on the lower parts, the abdomen being sepia brown like the tibial feathers and under tail coverts and very little different from the slightly more bronzy breast, and the conspicuous white lateral edges on the under surface extending down to the belly. The small size, the uniform dark brown pileum, malar region, and sides of neck, and the lack of grayish edges on mantle and wing coverts are other striking features.

P. ortoni is restricted to the Tropical Zone of western Colombia and western Ecuador.

Field Museum, Chicago.

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[1] Vollst. Naturg., Tauben, p. 151, pl. 271, figs. 2493–94, 1862.—This is the first valid introduction of the name, *P. boliviana* Bonaparte (Compt. Rend. Acad. Sci., Paris, *42*, p. 877, 1856) being an absolute *nomen nudum*.

[2] We call attention only to certain species of *Diphlogoena*, ascribed to "Bolivia," which are found exclusively in northern Peru.

GLOSSY IBIS IN FLORIDA.

BY JOHN BONNER SEMPLE.

EMERGING from my one-man, mosquito-proof tent, after having been awakened by the loud call of a Sandhill Crane overhead, I was just in time to see the sun rise over the rim of the prairie in which the great marsh lies. Before me lay stretches of open water with patches of lily pads and other aquatic plants, and here and there beautiful little islands of pale green myrtle bushes and high saw-grass. Near at hand, walking about in the mud and seeming not to notice me at all, were half a dozen Limpkins, busily looking for clams and water-snails.

After a hurried breakfast, my companion and I set out on foot toward the middle of the marsh. Fortunately the distance we had to travel was only a few miles, as the walking was very bad. For long stretches it was necessary to feel with an advanced foot for a spot sufficiently firm to support one's weight; every opportunity was taken to step upon the roots of lilies and other water-plants, and even then there was the chance of breaking through to the waist. In some places as we advanced the whole surface of the bog would tremble and shake as if it were a mat of floating vegetation, none too thick. After a tiring walk, during which both of us broke through several times, we approached one of the small islands where a number of white birds could be seen, perched on the higher myrtle bushes. As we drew nearer, the birds began to take wing—Snowy Egrets, Louisiana Herons, and a few Anhingas; but thus far we had not seen the slightest sign of the particular birds for which we were looking. Not until we had come quite close did we see them. Then suddenly from near the center of the little island rose a band of beautiful Glossy Ibises. Circling overhead, with their lovely iridescent plumage glistening in the tropical sunlight, they were truly gorgeous to see. We counted them, as best we could, and made the number approximately fifty. But accurate counting was impossible, because of the two or three hundred birds of other species in the air with them. These were the Snowy Egrets and the Louisiana Herons,

together with a few White Ibises, and quite a number of Anhingas. The last, because of their dark color, made the counting of the Glossy Ibises most difficult. Going on into the rookery, we found nests of all the birds which have been named, excepting only the White Ibis. They do not seem to be popular with their dark cousins; the two never nest and rarely feed together. We counted thirty-five nests of the Glossy Ibis; some just being completed, others with one, two, or three beautiful dark green eggs. One nest contained four and another five eggs. The nests were all built in the saw-grass and were from two to five feet from the ground. Most of the Herons' and all of the Anhingas' nests were in myrtle bushes. The Glossy Ibis nests were rather large, fairly well cupped, and constructed of dried saw-grass and deer's-tongue, with a few pieces of green water-fern or green saw-grass in the lining. In some a few myrtle sticks were used near the bottom. The outer edges of the nests were dabbed with white marl from the feet of the birds. One nest was of substantial construction; it measured a foot and a half from top to bottom. All the others seemed to have been hurriedly built. We learned that this ibis colony had begun to nest on a similar island about two miles distant, but had scarcely finished building when their rookery was burned out by careless "gator" hunters. It was not difficult to distinguish both the nests and the eggs of the Ibis from those of the Herons and Anhingas, among which they were nesting.

Our stay in the rookery was brief and we kept a sharp lookout for crows, which are always ready to rush in for eggs or young birds before the parents return. After walking away a few hundred yards we sat down and again attempted, though without success, to make an accurate count of the Glossy Ibises as they returned. But, taking our approximate count of fifty, and allowing for, say, twenty birds off feeding in the marsh, and considering the number of nests, an estimate of seventy birds in this colony seems conservative.

An old plume hunter told us that some years ago this colony of Glossy Ibises numbered only about a dozen pairs.

With the feeling of being well repaid for our labor, we plodded slowly back to camp, the last mile being made in very poor time. Grateful indeed were we for the cool evening after the fierce sun

had set, when we could sit and look out over the prairie and marsh. Sandhill Cranes were at play out on the "burn"; an Everglade Kite flew slowly by, looking for water-snails. Just before turning in for the night, a flock of thirty-five Sandhill Cranes passed high over head, closing the day with the same weird call with which it was begun.

The region in which this rookery lies is Central Florida, and the date of the visit was April 25, 1932.

Sewickley, Pa.

GENERAL NOTES.

Leach's Petrel on the Coast of Maine.—After a voyage of about one hundred and eighty miles (measured in an air line), made by us in June and July 1931, when upwards of two hundred islands and ledges were examined for breeding sea birds, we commented on the condition of this species,[1] having in view the general result of our finding, compared with conditions observed a few years previously, and remarked that no reason for the present scarcity was apparent.

In presenting some new data of a local nature, on an old subject, namely "Cats and Petrels,"[2] a recent writer has taken occasion to single out one of us as the author for the statement, and to present as an explanation of the general scarcity, the local conditions cited in her communication.

Incidentally, a statement contained in this recent article, that cats were found to be digging the birds from their burrows, is so unusual and contrary to the experience of those who have written on the subject, that we are constrained to suspect a lapse of memory, or the use of misinformation, and suspect that the digging mentioned should have been attributed to dogs, leaving the cats to follow their usual method of seizing the low flying birds as they hovered over their nesting places, or struggled to rise after emerging from their burrows. At various times since 1905[3] a number of articles have appeared in periodicals, showing the deplorable reduction, and in one or more instances extermination of large colonies of these birds by domestic cats and dogs.

Serious as this form of destruction has been, it fortunately is a local matter. During the last fifty years Leach's Petrel has been known to breed on 26 islands on the coast of Maine between Machias Seal Island and Casco Bay, and nearly all of these places are still resorted to by this bird. Only eight of these islands have been tenanted by man, with his marauding pets.

It seemed to us that some widespread check, temporary or permanent, has been operative during the last few years, and no visible cause was found, for the general decrease. Besides man and his pets, minks and Duck Hawks are known to be important enemies of this petrel, and we have known colonies to be temporarily abandoned by the petrel before the onslaughts of these dreaded foes. We saw no Duck Hawks, and no indica-

[1] 1931, Norton & Allen, Auk, XLVIII, 592.

[2] 1932, Perkins, Auk, XLIX, 212.

[3] 1905, Dutcher, Norton Ms. Bird-Lore, VII, 91. 1906, Norton, Journ. Maine Orn. Soc. VIII, 73; relating to Wooden Ball. 1908, Moses, Journ. Me. Orn. Soc. X, 91; relating to Machias Seal Island. 1910, Pearson, Smith Ms. Bird-Lore, XII, 261; relating to Matinicus Islands. 1911, Smith, Journ. Me. Orn. Soc. XII, 60; relating to Wooden Ball. 1911, Pearson, Bird-Lore, XIII, 277; 1 fig.; relating to Machias Seal Island. 1911, Brown, Bird-Lore, XIII, 243–245; figs.; relating to Machias Seal Island. 1925, Norton, Maine Natr. V, 46–56; relating to Matinicus Islands.

tions of their work, in the breeding area of the Petrel last summer, and it is but seldom that minks reach the remote breeding places of the bird. At present, moreover, this valued fur bearer is at low ebb of abundance on the coast of Maine.

It seems possible that these birds, of slow development, may require several years to reach maturity, which may account for some of the temporary periods of scarcity with returns to comparative abundance, which have been observed on several occasions in the past.

With man now domiciled on five of the islands occupied by the bird, it seems to us that the only permanent hope for the future of this unusual and highly interesting bird is the ownership of several sizable breeding places of the species by the Audubon Society, with a special fund for the enforcement of regulations which will insure the places from encroachment and resulting destruction of the birds.

We may mention, as a beginning in this direction, the purchase of Little Duck Island in Hancock County by Mr. Benjamin W. Arnold, who has devoted it to the purpose of a bird sanctuary, over a decade ago; also the purchase of Western Egg Rock, in Lincoln County, for the same purpose, by the Cumberland County Audubon Society of Portland, Maine.—ARTHUR H. NORTON, *Museum of Nat. Hist., Portland, Maine,* and ROBERT P. ALLEN, *National Assocation of Audubon Societies, 1775 Broadway, New York, N. Y.*

The Breeding of the Brown Booby in Porto Rican Territory.—The known breeding colonies for the Brown Booby (*Sula leucogaster leucogaster*) in Porto Rican waters have been the islands of Mona and Desecheo in Mona Passage to the west of Porto Rico, with report of another station on two small rocks north of Culebrita Island.[1] The last is based on hearsay evidence only and is somewhat uncertain.

It is of interest, therefore, to place on record information sent to me by Major Chapman Grant who recently has made numerous observations on natural history in this area. Under date of March 20, 1932 Major Grant forwards a snapshot of a Brown Booby with a well grown young taken March 11, 1932, on "El Blanquillo" an islet in the Cordilleras Reefs, a chain of islets and reefs extending along the extreme northeastern point of Porto Rico. The location is said to be between Icacos Cay and Diablo Cay. Eggs and three-fourths grown young were said to be present at this time. This gives definite evidence of the nesting of this booby in a locality where it had not been reported previously.—ALEXANDER WETMORE, *U. S. National Museum, Washington, D. C.*

The European Cormorant in New Jersey.—Referring to the status of *Phalacrocorax carbo carbo* on the New Jersey coast (Auk, Vol. XLIX, p. 77), the writer has, several times, seen winter birds about Barnegat Bay

[1] See Wetmore, Birds of Porto Rico and the Virgin Islands. Scient. Surv. Porto Rico and Virgin Islands, Vol. 9, Pt. 3, 1927, p. 282.

which, judged merely by size and manner of flight, were probably of that species. But it was not until February 23, 1931, that a bird was positively identified as such. This was a single individual flying from the bay through the inlet. It was first noted by John H. Baker and as it came closer in good light we could see distinctly the white on the cheek, chin and flank of this otherwise black bird. Since identification of single cormorants in the field is so difficult unless the bird is in, or approaching, breeding plumage, or is seen very near at hand, this species is probably of more regular occurrence than the published records indicate.—CHARLES A. URNER, *Elizabeth, N. J.*

Wintering or Early Arrival of the Great Blue Heron in Connecticut.—On March 4, 1932, a neighbor of mine, Mrs. Charlotte Williams, who lives on the banks of the Norwalk River here in Wilton, Conn., watched for more than ten minutes a Great Blue Heron (*Ardea h. herodias*) standing on a rock near the edge of the stream, which is at this point about twenty-five feet wide. She was scarcely twenty feet away and described the bird to me in detail.

The species is not uncommon here in summer or in migration but the earliest state record of which I am aware is March 22, 1902 at New Haven. Since Great Blue Herons occasionally winter on Long Island it seems likely that this bird took advantage of the mild winter to stay in this locality, or at any rate, went only a short distance to the southward.—DEVERE ALLEN, *Wilton, Conn.*

A Compartively Tame Eastern Green Heron.—On Sept. 13, 1931, I saw an Eastern Green Heron, which remained perched while I sat under a tree twenty-five feet away. When other people approached, the heron made low throaty notes similar to the call of a Yellow-billed Cuckoo instead of the customary harsh alarm notes.

It glided down to the edge of the stream where it perched on a snag five inches above the water and began to fish—only thirty feet away from me. Several times, as I walked along, frogs jumped into the stream and the heron, which was on the opposite side of the stream, would squawk, and fly into the stream within eight feet of me in an attempt to catch the frogs. Twice when frogs jumped into the water, the perching bird squawked and raised its "crest."

Once while I was within twelve feet of the heron it became excited, turned its head sideways, stretched its neck and looked upward. I looked in the same direction and saw the cause of its behavior—a fox squirrel was coming down a nearby elm "jerking" its tail. While this was occurring the heron kept up a continual throaty cuckoo-like call.

When the bird again resumed fishing I was able to maneuver to within eight feet and saw it catch a one-inch crawfish, a tiny minnow, a larval salamander (*Eurycea b. bislineata*) and a large tadpole. It ate the tadpole and then jabbed its bill into the water, either to drink or to wash out the mud.—LOUIS B. KALTER, *535 Belmont Park, Dayton, Ohio.*

White-fronted Geese Wintering at Vernon, Texas.—In November, 1929, a single White-fronted Goose appeared at the Zacaquiesta Ranch, fourteen miles south of Vernon, Texas, and stayed with a bunch of tame geese until March, 1930. Late in November, 1930, a lone White-fronted Goose appeared back at the same place. In November it disappeared for about three days and returned with another White-fronted Goose and the two remained until early April, 1931, and again disappeared. Late in December, 1931, three White-fronted Geese appeared at the same place and are today with the tame geese. These birds are gentle and allow you to come up to within ten feet of them any time.—R. L. More, *Vernon, Texas.*

Lesser Snow Goose in South Carolina.—On November 11, 1931, a strange goose was shot on the Grove Plantation of Mr. J. Thompson Brown, near Adams Run, Charleston County, S. C. A hunting party was approaching the duck pen in the rice fields when seven Canada Geese (*Branta c. canadensis*) and a strange white goose arose and flew away. They had evidently been feeding with the live duck decoys in the pen. The Canada Geese did not return but the other bird after making a wide circle came back and was shot. Its plumage and measurements were carefully noted by Mr. Brown and later given to me. Only the wings were saved.

The bird seems to be a Lesser Snow Goose (*Chen hyperborea hyperborea*) in immature plumage; measuring length 24 ins., wing spread 48 ins., and wing 15 ins. It is apparently the second record for the state.—J. Willcox Brown, *White Oaks, Montchanin, Delaware.*

A Change in Distribution of the Fulvous Tree Duck (Dendrocygna bicolor helva) in Texas.—The common notion regarding the distribution of this duck in Texas seems to be that its summer habitat is the Lower Rio Grande Valley where it spends much of its time in trees, making its nest in the natural cavities thereof, and securing its food in cornfields. This was doubtless the case many years ago but it is now untrue in all three particulars. The late Capt. R. D. Camp of Brownsville, himself an active collector of bird skins, told me two or three years ago that he was anxious to have a few skins of this duck and inquired of me if I knew where they might be obtained. They had long since disappeared from their old haunts.

A recent excellent work on the present status of wild fowl says of this bird that it is nowhere common in the United States except in Southern California and that it "occasionally" breeds in the western part of the Gulf district. The authors, Philips and Lincoln, had access to the available literature on the subject so it is evident that it is not well known that the Fulvous Tree Duck breeds commonly in the rice-field region sixty or seventy miles west and southwest of Houston.

About twenty years ago it began to appear in small numbers near Bay City in Matagorda County, apparently having worked its way northward along the Gulf coast, and about two years later it was noted at Eagle Lake in Colorado County at which point it has been under my observation for a number of years. This region, where the chief agricultural activity is the

growing of rice seems to be its center of distribution. It should be noted that the lake, covering some two thousand acres, lies a mile or two away from the town bearing the name Eagle Lake. It is a paradise for ducks during the winter months no less than twenty species having been recorded there from time to time.

The local name for this duck is "Mexican Squealer," indicative of its source and note. Not many are to be seen in winter except when there is a succession of unusually mild days. About the middle of April, the first migrants begin to appear and within thirty days it is very common in the lake. While there are trees in abundance around the lake and plenty of them have hollows, I have never yet known one of these ducks to deposit its eggs in a hollow tree or to so much as alight on a tree. The nesting season is somewhat later than that of the Mottled Duck which is a constant resident about the lake. Many of the nests of the Tree Duck are placed on the levees out in the rice fields and there is not enough vegetation to conceal them unitl June. I have also found nests in the reeds and grasses on the so-called "floating islands" in the lake but most of them are built in the rice fields or near small ponds on the prairie. They are composed almost entirely of rushes and grasses with practically no downy lining.

In July and August when the rice is in "the milk," that is to say when the kernels are soft and juicy, this duck wreaks havoc in the rice fields. The plant is bent over by the weight of the bird's body and the "head" containing the grains completely nibbled off. When it is taken into account that a flock of a thousand or more may descend into a field in one night some idea may be gained of the heavy damage resulting. The largest numbers are to be seen in the late fall just before the southward migration. This is after the beginning of the shooting season and as the bird subsists almost entirely on rice, the flesh should be unusually palatable. Nevertheless it is rarely shot by sportsmen as it is not looked upon as a "gamey" quarry. Unwary, moving in flocks of hundreds, it is regarded as an unworthy target.—J. J. Carroll, *Houston, Texas.*

The Black Duck in Oregon.—Because of the somewhat uncertain status of *Anas rubripes* in Oregon, it seems desirable to record a specimen of this species, banded at Lake Malheur, on November 14, 1930, by U. S. Reservation Protector George M. Benson. The bird was marked with Biological Survey band No. B601081. It has not yet been reported as a return.

Although there is a possibility that the bird was an "escape" from some zoological park or game farm on the Pacific coast, it is interesting to note that in 1887, George Law, in a glowing account of the game birds of Sauvies Island, Oregon, which was published in American Field,[1] included the Black Duck as one of the species of waterfowl that might be found in November in the bag of a sportsman.—Frederick C. Lincoln, *Biological Survey, Washington, D. C.*

[1] Vol. XXVIII, p. 174.

A Sight Record of a European Teal in Ohio.—On the afternoon of March 6, 1932, while looking over some ducks which were sitting upon the water in a partly frozen bay of Buckeye Lake, in Licking County, Ohio, I discovered a male European Teal (*Nettion crecca*) near a group of six male Green-winged Teal (*Nettion carolinense*) and one female teal which I also took to be a Green-wing. As I had a pair of 8× Zeiss binoculars and was only some 120 feet from the birds, the distinguishing characteristics of the European Teal were so obvious as to be instantly recognizable; namely, the creamy-white long scapulars and inner secondaries, forming a conspicuous broad white streak along each side of the back, and the total absence of a white crescent on the side of the breast in front of the bend of the wing. There was also a distinct difference between the color and vermiculation of the sides of the breast, sides and flanks in the two species; in the European Teal the vermiculation was considerably coarser and the ground color a darker grayish-slate than in the Green-wing.

The ducks were under almost continuous observation for approximately one hour, during which time the six male and one female Green-winged Teal remained in a more or less compact flock. But whenever the European Teal attempted to join them he was chased and picked at by one or more of the others until driven away.

An unsuccessful attempt was made to collect the bird, and though it was looked for carefully on several days thereafter it was not seen again. Even if the bird did remain in this vicinity for some time the chances of its being seen are slight due to the teals' habit of keeping in the cattail marshes and about the dead vegetation where they are difficult to locate until flushed. It is only when they are driven into the open, that opportunities for careful observation are had, and this may well be one of the reasons for the European Teal not having been recorded more frequently.

There appears to be but one previous Ohio record, that of a specimen collected by the late Rev. W. F. Henninger. (See Walker: The Wilson Bulletin; Vol. 43; p. 63.)—Milton B. Trautman, *Ohio Division of Conservation, Columbus, Ohio.*

The Harlequin Duck in Minnesota.—An immature male Harlequin Duck (*Histrionicus histrionicus*) was collected by the writer on Lake Superior fifty miles northeast of Duluth, Minnesota, on April 10, 1932. This was a lone bird found feeding in a protected bay. The immature plumage was rather worn and the deep blue-gray feathers of the adult plumage were just appearing on the back and in the scapulars and only a faint suggestion of the chestnut sides was evident. The Museum's collection does not contain sufficient material to allow subspecific determination in this plumage. According to the Museum records this is the first authentic occurrence of this species in Minnesota.—W. J. Breckenridge, *Museum of Natural History, University of Minnesota, Minneapolis, Minn.*

Eider Duck (Somateria mollissima dresseri) on the Connecticut River in 1932.—On April 18, 1932, a day earlier than they were seen last

year (Auk, XLVIII, page 615) Eider Ducks were found feeding in company with Black Ducks on a flooded space where the swollen river overflowed its banks, in West Charlestown, N. H. There were four males and at least as many females. Their presence again this spring is interesting in that it may prove the species a more common migrant on this waterway than has been suspected.—Lewis O. Shelley, *East Westmoreland, N. H.*

The American Eider in Colorado.—During the forenoon of February 25, 1932, Mrs. R. J. Kerruish and Miss Susan Goddard of Littleton, Colorado, and Miss Prue Bostwick of Denver in company with the undersigned, visited Marston Lake, near Littleton, Colo., on which there were, at the time, several hundreds of ducks, and some geese.

These birds were studied for a couple of hours with a high power telescope (× 40) which brought them so close, as it were, that every detail of bill, color, and color-pattern was distinct, and unmistakable. Miss Bostwick, in examining the flocks, drew attention to a duck which exhibited a striking forehead marking; further and prolonged examination showed the bird to be a male American Eider (*Somateria mollissima dresseri*). We had with us Vol. I of Forbush's 'Birds of Massachusetts,' the Eider plate of which enabled every one to verify the diagnosis.

While extremely skeptical of the value of sight identifications of birds rare or unknown in the area of observation, the circumstances of the identification of this eider were so extraordinarily favorable and easy that its correctness is beyond question. There are two previous records (Cooke, Birds of Colorado, Append. p. 157) of this eider in Colorado. One is utterly worthless: "a mounted bird of this species in the rooms of the Society of Natural History in Denver" with no data. The second record is only a shade better: "taken by W. G. Smith at Loveland sometime previous to 1892" said to be in Mr. Smith's collection but specimen not seen by Cooke and no other data published.—W. H. Bergtold, *Denver, Colo.*

"Duck Ponds" in Holland.—The establishment in the United States of what are referred to by the uninforming name of "duck ponds" of the Holland pattern has been urged as a conservation measure. We are informed that these devices are still in operation with the same "wonderful results" that they have yielded for generations in the past.

The "duck ponds" prove to be only what are known in England as "duck decoys," that is, ponds to which wildfowl are attracted and which are equipped with devices for trapping the birds. These ponds are usually well-screened by trees and surrounded by dikes or walls so that when the birds are inside they cannot see what is going on outside. The Dutch Government prohibits all interference with the ducks for about a mile in all directions, and no shooting or other disturbance is permitted on the entire preserve.

Some of the birds are wing-clipped and especially trained to feed in, and thus lose fear of, the leads to the traps. These usually are females which, retained in the ponds until their quills are renewed and they are again able

to fly, serve as guides to bring other birds into the ponds. These wild birds if not trapped leave the pond at dusk, but return for food the next day, bringing others with them, so that in the height of migration great numbers come into the ponds. For nine months of the year no one but the trainer is allowed in the enclosure and training is kept up daily. Some of the Mallards breed, long vase-like nests woven of straw being provided for them, but the other species do not breed when wing-clipped and kept in the ponds. Regardless of the minor feature of Mallard breeding, the duck ponds can scarcely be termed propagating places for wild ducks; rather they are essentially duck traps.

Holland being in the main path of migration for the waterfowl of western Europe is admirably located for the operation of duck decoys. Thousands of the birds come into the ponds during migration and catches of from four to five hundred birds per day are not uncommon. At one of them it is said that more than 4400 Widgeon were taken in a week. Authentic statistics recently published (Ardea, *20*, 1931, pp. 152–169) show that nearly half a million birds have been captured in a single season by the 145 duck decoys known to be in operation in Holland. Enthusiastic advocates of decoys allege that 3,000,000 wild ducks are trapped in them annually. Whether a half million or more it needs no saying that Holland is reaping a much larger duck crop than she is entitled to, that is to say one out of all proportion to the number of ducks that are actually hatched and raised in the country. Not only are wildfowl produced in other countries thus caught wholesale, but the breeding stock of those countries also is reduced by the numbers of birds that are retained in these ponds and thus rendered non-productive during the breeding season. These duck ponds, while a source of revenue to their proprietors and to Holland, are almost wholly destructive from the standpoint of wildfowl conservation and are certainly not devices to be invited in countries now fortunate enough to be free from them. Any moves to establish them in the United States should be stamped out forthwith.—W. L. McAtee, *U. S. Biol. Survey, Washington, D. C.*

A New Genus for Rallus poecilоptera.—In working on the rails for the second volume of my 'Check-list' I have come across a number of cases wherein I cannot agree with the arrangement used by Sharpe in the 'British Museum Catalogue' and later adopted by him in his 'Hand List.' Most of these cases are questions of difference of opinion as to the validity and limits of certain genera, but in only one case has it not been possible to accomplish a rearrangement either by "lumping" genera or transferring species.

The genus *Eulabeornis* Gould as constituted by Sharpe consists of

E. castaneoventer Gould (type of the genus)
E. woodfordi (Ogilvie Grant)
E. poecilоptera (Hartlaub)

A simultaneous examination of the three species clearly shows that the

continuance of Sharpe's arrangement is not possible, since *castaneoventer* bears no close relationship to the other two species. Indeed *castaneoventer* in spite of its unusually long (for a rail) tail and somewhat shorter and stouter tarsi recalls Aramides; *poeciloptera* and *woodfordi* look as though their affinities might be nearer to Habroptila.

Since there is no other genus in which they can be placed and no generic name available I propose

Nesoclopeus Gen. nov. *Type, Rallina poeciloptera* Hartlaub.

Characters.—Moderately large, heavily built Rallidae with stout bill and legs; nasal sulcus wide and deep; tail about half as long as wing; wing with fifth (from outside) primary longest, or slightly exceeding third, fourth and sixth; primaries exceeding secondaries by more than half the length of the bill; tarsus longer than middle toe without claw.

The two species will stand as follows:—

Nesoclopeus poeciloptera[1] (Hartlaub).
Nesoclopeus woodfordi[2] (Ogilvie-Grant).

Remarks.—The diagnosis given above applies to both species, but there are several other points in which they differ so markedly from each other that there is no possibility of considering the two birds as representative geographic races.

In *woodfordi* the coloration is nearly uniform black; the plumage is lax with the tips of the feathers noticeably decomposed; *poeciloptera* on the other hand is olive or reddish brown above, gray below; wings distinctly barred with black and reddish brown; plumage normal. *Woodfordi* has the bill decidedly shorter than the middle toe; *poeciloptera* has it slightly longer.

It gives me great pleasure to acknowledge the loan of skins of *castaneoventer* and *woodfordi* from the American Museum of Natural History and to thank Dr. Ernst Mayr who selected the material.—James L. Peters, *Mus. Comp. Zool. Cambridge, Mass.*

Purple Gallinule in Cape May Co., N. J.—On May 8, 1932, I examined a specimen of Purple Gallinule (*Ionornis martinica*) which had just been caught on the beach at Anglesea, N. J., by Harry Callahan of that town. The bird was confined in a box and was in perfect plumage. There are at least three previous records for Cape May County and others from farther up the coast of New Jersey.—Witmer Stone, *Acad. Nat. Sciences, Philadelphia.*

Purple Gallinule at Harrisburg, Pennsylvania.—On April 14, 1932 Miss Eckenrode found an adult male Purple Gallinule (*Ionornis martinica*)

[1] *Rallina pœciloptera* Hartlaub, Ibis, 1866, p. 171 (Viti Levu, Fiji Islands).
[2] *Rallina Woodfordi* Ogilvie-Grant, Ann. and Mag. Nat. Hist. (6), 4, 1889, p. 320 (Aloa, Guadalcanar, Solomon Islands).

walking along a street in Harrisburg, Penna. The bird was brought to Dr. Winecoff, in Charge of Research, Game Commission, and identified by him. It was later released in Wildwood Park.

On April 19, 1932, Mr. Robert Leiter, photographer for the Game Commission, and the writer, found the same bird dead in an emaciated condition. Upon dissection of the carcass, the keel of the sternum was found to be fractured and the muscles bruised. Strangely enough the testes were very poorly developed.

Since I have been unable to find any record of the color of the iris, I record it here as dark brown. This of course was the color after the bird was dead for one day.

To the "casual range" in the A. O. U. 'Check-List,' should be added Pennsylvania, New York, Connecticut, Rhode Island and New Hampshire (cf. Warren, Eaton and Forbush).

At present this specimen, which unfortunately lacks tail feathers, is in the writer's possession.—W. Stuart Cramer, *201 E. King St., Lancaster, Penna.*

The Red Phalarope in New Jersey.—While visiting Brigantine Beach, N. J., on May 15, 1932, I was fortunate enough to see two Red Phalaropes (*Crymophilus fulicarius*). They were about one hundred yards apart swimming on one of the channels on the edge of the salt meadows, in fairly deep water. They were picking up food of some sort from the surface of the water holding the bill vertically, point down, and when a morsel would float past they would spin about to secure it. The white bar on the wing was very evident.

Natives informed me that the water was full of these birds a few days before, especially farther back on the meadows. Rainy, stormy weather prevailed during the week prior to my visit which doubtless drove the birds in shore. I learn through Dr. Stone that Mr. Joseph W. Tataum who was at Brigantine the same day that I was there, found a dead Red Phalarope which had apparently struck a telephone wire.—W. Stuart Cramer, *201 East King St., Lancaster, Pa.*

Additional Note on the Breeding in Maine of the Great Black-backed Gull (Larus marinus).[1]—Through the kindness of Mr. Lewis O. Shelley, our attention has been called to the records of occurrence of the Great Black-backed Gull in Maine and Massachusetts. In 1928 the occurrence and probable nesting of the Great Black-backed Gull (*Larus marinus*) was noted in a large Herring Gull (*Larus argentatus*) colony on Duck Island of the Isles of Shoals group, off the coast of New Hampshire and Maine. Subsequent observations showed that at least three pairs of the black-backed species were successful in raising young on that island, and that possibly seven other pairs nested there. We were unable to locate the nests of the latter pairs, but the adults were constantly seen. During the

[1] Published through the Dwight Memorial Fund.

summer of 1930, photographs were obtained of the adults and young of the Great Black-backed Gull.

The larger species apparently lived in perfect harmony with the smaller, and more abundant, Herring Gulls. The total gull colony was estimated at two thousand pairs, and they occupied an area of about twenty acres. The three nests of the Black-backed Gulls were some distance apart, and Herring Gull nests were within a few feet of each.

In a recent article, Richard J. Eaton[1] says, ". . . it is highly probable that the Black-backed Gull within a very few years, if not in 1931, has made the first definite southward extension of its breeding range since Audubon's time." The records of Arthur H. Norton and Robert P. Allen[2] give further evidence of this extension. They record the breeding of this species on ten islands farther up the coast than our record. Our data show that the southward extension of breeding range began at least within the last three years, and probably a few years earlier.—C. F. Jackson, and Philip F. Allan, *Univ. New Hampshire, Durham, N. H.*

Nesting of the Eastern Mourning Dove.—Though the Mourning Dove is well known to appropriate abandoned nests of the Robin and other birds my attention was recently called to a case where the Dove drove the Robin from a newly made nest, the Robin submitting without protest. As usual the Dove put a shallow lining in the nest before using it.

During the summer of 1931, I witnessed several attempts of a Dove to drive a Robin from a nest that it was remodeling for a second brood but the Robin waged a successful fight and the Dove built a nest of its own nearby.

The past mild winter seemed to induce the Doves to nest earlier than usual. In mid-February an egg was found near a nest that Blue Jays had destroyed and on March 3, 1932 a young Dove just hatched was found on the ground under a nest.—Myra Katie Roads, *Hillsboro, Ohio.*

Early Breeding of the Eastern Mourning Dove in Virginia.—The unusual weather conditions prevailing during the past winter and spring have resulted in some curious ornithological records. Among these the following account of an early nesting and laying of the Mourning Dove (*Zenaidura macroura carolinensis*) in Virginia, is of interest.

On February 21, 1932, while following an old wood road leading from the valley of Potomac Run, Virginia, to the upland, we flushed a female dove from her nest located in a small pine (*Pinus virginiana*), beside the road. Investigation revealed two eggs which were collected and are now in the National Museum collection. They appeared to have been slightly frozen, but were not cracked. The parent had utilized an old Cardinal's nest for the foundation of her own flimsy structure. The site of this nest is about

[1] Eaton, R. J.: The Auk, vol. XLVIII, No. 4, pp. 588–589, 1931.

[2] Norton, A. H., and Allen, R. P.: The Auk, vol. XLVIII, No. 4, pp. 589–592, 1931.

fifty miles by motor from the capitol city, and about midway between Stafford and Fredericksburg, Virginia, on U. S. Highway No. 1. The earliest previous record for this section as given by May Thacher Cooke[1] is April 6, 1919.

An interesting sequel to the collection of this set was noted on April 3, 1932, when we again visited this locality. A short search resulted in our flushing the bird from a new nest of her own construction, placed in a windfall about four feet from the ground, and within fifty feet of the site of the earlier effort. The nest again held its two eggs which we left undisturbed. Incubation appeared to be considerably advanced.—ALEXANDER WETMORE and FREDERICK C. LINCOLN, *Washington, D. C.*

Late Occurrence of Eastern Mourning Doves.—On December 27, 1931, the writer observed near this city a flock of between sixty and seventy Eastern Mourning Doves (*Zenaidura macroura carolinensis*), interesting both for its size and the late date of occurrence, undoubtedly due to mildness of the season. The birds were on the ground, evidently feeding, in a brushy tract at the edge of woods. Upon being disturbed they arose almost *en masse* and alighted in near-by, barren-limbed trees, presenting a picture strikingly remindful of certain Passenger Pigeon delineations. Small groups of doves have been recorded as wintering hereabout during recent years. It should be stated, however, that their general numerical status in central Illinois shows a very noticeable decrease within the past decade.—HAROLD M. HOLLAND, *Galesburg, Ill.*

The Snowy Owl in South Carolina.—On December 29, 1931, I was watching some small birds on the Grove Plantation near Adams Run, Charleston Co., S. C. Suddenly I noticed a movement in a clump of Spanish moss in a nearby live oak and as I looked up a Snowy Owl (*Nyctea nyctea*) burst out of the tree and flew noiselessly away. The identification was unmistakable as the bird flew directly in front of me.

I procured a gun but was unable to secure him and when last seen he was flying away over the rice fields.—J. WILLCOX BROWN, *White Oaks, Montchanin, Delaware.*

Snowy Owl in Michigan.—During the winter of 1930–31 I observed three of these birds near McMillan, Luce Co., Michigan. One on December 5, 1930, perched on the top of a dead hemlock. It or another individual was seen on several subsequent dates by Mr. R. S. Ruggles who lives near-by. Another bird flew past my trapping station and rested for a while on a balsam fir tree on January 8, 1931. The third observation was of a bird perched on the top of a windmill on February 19, 1931. It was heavily barred with black, evidently a female.—OSCAR MCKINLEY BRYENS, *McMillan, Luce Co., Mich.*

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[1] Birds of the Washington, D. C., Region. Proc. Biol. Soc. Wash., Vol. 42, p. 34, Mar. 25, 1929.

Snowy Owl, a New Species for Alabama.—The following clipping, taken from the Charleston, S. C., 'News and Courier' of December 24, 1931, reprinting an item from the old 'Charleston Courier' of December 24, 1831, seems sufficient grounds for including the Snowy Owl (*Nyctea nyctea*) in the avifauna of the state of Alabama:—"A beautiful White Owl was recently taken near Selma, Alabama, the length of its wings when expanded was five feet. It was presented to the Museum of the University of Alabama, as a rare specimen of American ornithology."

While it is certainly not a recommended practice to base important records on unscientific, newspaper citations, it seems justifiable to do so in the present instance, because (1) confusion seems to be limited, by the words "White Owl," to but two species, the Barn Owl and the Snowy Owl; and (2) the definite dimension of "five feet" for the wing spread, when compared with accepted measurements published by present-day ornithologists, positively eliminates the Barn Owl.

The necessarily slow schedule of the mails of those old days, places the date of capture of the specimen as not later than the first week of December, 1831.—Helen M. Edwards, *Fairhope, Ala.*

Blue Jay Feeding on Stoneflies.—Relatively few passerine birds have been recorded feeding on the insect order Plecoptera. It seems worthy of note to place on record an observation the writer made on March 18, 1932. While attempting to collect a pair of Blue Jays, near Ithaca, N. Y., attention was drawn to the behavior of several of these birds feeding on the snow, along a small stream. Two were collected and their stomachs examined, after the conventional skins were made. The contents revealed remains of innumerable stoneflies (*Capnia vernalis*) which were crawling in large numbers from the stream as recently transformed imagos. The stomachs likewise contained a small amount of sand, in each instance, while one had parts of an acorn. A foot of snow covered the ground at this time.—W. J. Hamilton, Jr., *Cornell University, Ithaca, N. Y.*

Long-billed Marsh Wrens Wintering near Toledo, Ohio.—Recent observations have resulted in the discovery that the Long-billed Marsh Wren (*Telmatodytes palustris palustris*), although listed only as a summer resident in northwestern Ohio, is at least an occasional, if not a somewhat common, winter resident in the extensive cattail marshes bordering on the southwest shores of Lake Erie.

During the past six years, I have obtained five records of Long-billed Marsh Wrens wintering in the Erie marsh, situated at the extreme southeastern part of Michigan bordering on Lake Erie; and in the Little Cedar Point Marsh in Ohio, almost directly across Maumee Bay southeast of the Erie marsh. Both of these marshes are within ten miles of the Toledo city limits. Three of these records, Feb. 4, 1928, Feb. 3, 1929, and Jan. 22, 1932, were obtained at the Erie marsh, and the others, Dec. 20, 1930 and Dec. 26, 1931, at the Little Cedar Point marsh. The last two individuals were either heard or seen on many subsequent field trips.

Only in the cattail marshes, both *Typha latifolia* and *T. angustifolia*, have these shy and secretive wrens been found. The first one I found was discovered accidently while I was "squeaking" at a Song Sparrow. Wondering if others could be called by this means, I tried other places. All of my other winter records were obtained by "squeaking" or by an imitation of the Screech Owl's call.

Having selected a likely looking patch of marsh, the observer "squeaks" or "screeches" for a few minutes. If the wren's scolding notes are not heard, another favorable looking locality is tried. Obviously, only a small portion of an extensive marsh can be covered in this manner on an ordinary half day's field trip, and in all probability, nearby wrens which are in the vicinity do not always answer to the calls.

When the small size and shyness of the Long-billed Marsh Wren are considered, and the acres of cattails with their innumerable hiding places are borne in mind, it is remarkable that any individual is found. So, it seems very probable that this species winters in greater numbers than my records would indicate.—Louis W. Campbell, *Toledo, Ohio.*

Early Nesting of Bluebird and Mockingbird.—On February 29, 1932, I obtained a nest with three Bluebird eggs. The nest was built in an old coffee pot which was hanging on the side of a barn. Upon blowing the eggs, I found that they were only beginning to incubate.

Due to the extremely warm weather throughout February, it is no wonder that the birds got a little tangled in their nesting dates and that the extremely cold weather which followed caught many of them with nests and eggs to protect. On March 4, 1932, I discovered a Mockingbird's nest that had not been completed. For three days I watched with interest the construction of this nest, and on the third day I became a little alarmed for the welfare of the newly constructed home. The temperature was steadily falling and snow was predicted. Nevertheless work went right ahead, and on March 7, in spite of ferezing weather, the bird laid. On March 8, the temperature again went below freezing, and again the bird laid. The following day we awoke to find the ground covered with snow and a temperature of 31° F. That evening I visited the nest and found three eggs. After waiting ten days, I examined the eggs and found them cracked with ants eating the contents. Even though this perverse bird refused to incubate, I consider the fact that she laid in such weather worthy of note.—Bernard H. Stevenson, *Waynesboro, Ga.*

The American Pipit at Glen Helen, Yellow Springs, Ohio.—Abnormally early spring weather accounted for the appearance of the American Pipit at Glen Helen, Antioch College, Yellow Springs, Ohio on March 8, 1932.

Had it not been for a period of bitterly cold weather from March 5 to 10 these erratic migrants would have gone unnoticed. A group of five was discovered along an unfrozen stream in the limestone gorge of Glen Helen.

They were all in winter plumage. The grayish-brown back and buffy breast made the birds inconspicuous against the dull greenish-brown of the algae-covered rocks in the stream in which they fed. One apparently did not have the usual white outer tail feathers.

The Pipits spent most of their time feeding in the half-inch of water that trickled over a series of receding rock ledges below a small waterfall. At other times they followed the cress-lined edge of the main stream or occasionally walked belly-deep across the twenty-foot wide stream, now and then pausing momentarily to perch on some exposed stick or rock. Their tracks were profuse in the snow along the edge of the stream and from them could be told the unusual length of the hind toe and toe-nail.

With the exception of an inch and a half earth worm which I saw one pick up on the bank of the stream all other food seemed to be taken directly from the stream or from tiny pools and pockets of water on the rock ledges. It probably consisted largely of caddis-fly larvae since the tiny nets of these swift-water aquatic insects were common in the cascading stream.

While the band of five Pipits stayed in an area of about twenty-five yards along each side of the stream, they were never seen together—usually there would be two or three on each side and when one would come within five to twelve feet of another a chase would occur. This "pursuit" flight was always accompanied by their low call note "tsee-tsee." Which bird gave it I do not know. Several times they alighted on the dry steep glen-side but they would soon walk down to the water. Only twice did I see them perch above the ground and then only a few inches above it on a fallen branch.

Three of the birds had left by March 10 and none were observed later except one on March 14.—Louis B. Kalter, *535 Belmont Park, Dayton, Ohio.*

Nesting of the Starling (Sturnus vulgaris) in Charleston, S. C.—The spread of the range of the Starling (*Sturnus vulgaris*) to the southward has been a matter of considerable interest to many. Though fairly well established in the Carolinas, the species has confined itself to a great degree to the Piedmont sections of both states, not appearing on the coast except as a rare winter visitor, and showing an extreme shyness which is utterly at variance to its habits elsewhere. The writer has kept a close watch on the status of the Starling in the Low Country of South Carolina, and, since the time it was first noted at "Dixie" Plantation on February 20, 1922 by Ellison A. Williams of Charleston, until the spring of 1929, when it was first discovered nesting at the McLeod Plantation on James Island, by the owner, William McLeod, the species has been, and still is, a very rare and erratic visitor.

About the middle of April, 1932, Mr. Edward A. Simons noted a few birds on the Battery in Charleston and Mr. E. A. Williams, on investigating, found a pair carrying nesting material to a hole high up on a telephone pole.—Alexander Sprunt, Jr., *92 South Battery, Charleston, S. C.*

Another Record of Brewster's Warbler in Lancaster County, Pa.—On May 8, 1932, at the Hammercreek Dam in Lancaster County, Penna., Messrs. C. L. Fasnacht, B. L. Sharp and the writer saw three Brewster's Warblers (*Vermivora leucobronchialis*), one male and two females, in company with a small wave of Golden- and Blue-winged (*V. chrysoptera* and *V. pinus*). This is the second record of Brewster's Warbler in Lancaster County, the first being the writer's record of May 8, 1931.—W. Stuart Cramer, *201 E. King St., Lancaster, Penna.*

Cerulean Warbler in Boston, Mass.—In view of the paucity of published records of the occurrence of the Cerulean Warbler in the eastern part, and, indeed, in any part of Massachusetts, I wish to report an adult, singing male of the species in the Boston Public Garden on May 2 and 3, 1932. Forbush, in his 'Birds of Massachusetts and Other New England States,' 1929, Vol. III, p. 247, mentions six records for the State, and I know of only one other, besides the Garden bird—that of a male banded on May 17, 1931 at the Austin Ornithological Research Station on Cape Cod. Furthermore, only one of Forbush's records was made in the eastern part of the Commonwealth and that nearly sixty years ago. I first noted the bird shortly after 8 A. M. on May 2, and immediately communicated with several friends who, during the course of the day, were able to see and hear it and to point it out to others. During its two day sojourn, nearly all the bird-lovers of the community had the opportunity of seeing this beautiful warbler, which, incidentally, brings the total number of species for the Garden to one hundred and sixty-eight.—John H. Conkey, *Boston, Massachusetts.*

Wilson's Warbler in Connecticut in January.—On January 16, 1932 I was standing in the Birdcraft Sanctuary in Fairfield, in conversation with Mr. Frank Novak, the warden, when a small bird flew across a path on the opposite side of the sanctuary fence. It was immediately recognized as one of the yellow-colored warblers, and a moment later a view through my glass identified it as Wilson's Warbler. Mr. Novak and I followed it through the grounds for some time, getting a number of satisfactory views of it. It was evidently an adult male, and appeared to be as brilliant in plumage as birds seen in the spring migration.

The bird did not go to the suet or other foods that were being visited by other species at the time, but fed among the shrubbery and on the ground, apparently gleaning minute insects or insect eggs from the twigs of the bushes. When we last saw the bird it was on the ground in an entirely open spot within ten feet of us, and no glass was necessary to make out all the details of its plumage.

This occurred a little before noon, and Mr. Novak reported that the bird appeared again at about the same time the following day, January 17. It has not been observed since that date.—Aretas A. Saunders, *Fairfield, Conn.*

Color of the Iris in the Great-tailed Grackle.—In connection with discussion as to the color of the iris of the Boat-tailed and Great-tailed Grackles, the following seems pertinent.

A pair of Great-tailed Grackles in my aviary recently received from the San Antonio Zoo are now in adult plumage and both birds show a yellow iris; that of the male a light yellow similar to the eye of the Bronzed Grackle and that of the female somewhat duller. The color does not at all incline to brown. I am not familiar with this bird in nature so do not know whether its eyes undergo a change of color but it seems strange that Fuertes who usually depicted his birds in their brightest or breeding plumage should err in this case, and he has painted both races with reddish brown eyes (Bird-Lore, July–August, 1922).—KARL PLATH, *2847 Giddings St., Chicago, Illinois.*

The Color of the Iris in the Boat-tailed Grackle.—Here in South Carolina, the iris of the adult male is pale yellow or straw and the eye of the female is likewise often the same color. It is probable that females with brown eyes are immature birds. Young males have dark eyes, i. e., pale brown or buffy brown, and this color seems to persist even after the birds are in apparently adult plumage. Only a few days ago (Feb. 18, 1932), the writer saw six male Boat-tails perched near the highway in the outskirts of Charleston. They all had brown eyes, and seemed in fine plumage, but their comparatively small size and short, unfolded tails showed them to be immature birds.

Major Brooks has said (Auk, XLV, p. 506) that the tail of *major* is not folded or plicated, but the adult males of South Carolina have the tails strongly plicated; this is not only a feature of the breeding season, but is present at all times and anyone who has seen them in flight must be impressed by the characteristic appearance of the tail. It has given the bird its common name. In the immature males, however, this character is either absent or scarcely noticeable, and the tail is shorter, as stated above.

The writer can confirm Mr. C. J. Pennock's observations on the sex-flocking habit of *major* (Auk, Oct. 1931). On this plantation (Middleburg) the writer has seen bands of adult males from time to time during the present winter, but no young male or female until February 23, last, when one female was seen with fifteen adult males. The latter were quiet; they took no notice of the female, and she finally flew away. The sexes do not begin to associate until in March. The males in this group were all large, glossy fellows with very long, folded tails.

Red-winged Blackbirds (*Agelaius phoeniceus*) also have this habit very strongly developed and no females have been observed in the marshes and old rice fields of this plantation during the present winter, although hundreds of males could be seen daily. The writer has often stood on the rice field banks and watched the Red-wings passing over in the afternoon, going to roost. Flock after flock, travelling in company front, would

sweep low overhead, and not one female could be detected. Thus, it appears, in the light of these observations and those of others, that one sex can commonly occur in a restricted locality during the winter months and the other be entirely absent. Might not this have been the experience of Major Brooks with the Boat-tailed Grackle?

It would be hard to imagine a more noisy bird than the male Boat-tail, and one with a greater variety of notes, but one must see it in the breeding season to appreciate this; in winter the bird is much more quiet. Besides the great number of sounds that issue from its throat, one frequently hears a curious rolling noise, made by the wings when the bird is perching, but occasionally during flight.—E. VON S. DINGLE, *Huger, S. C.*

Distribution of Yellow and Brown-eyed Males of Boat-tailed Grackle in Florida.—While on a motor trip through the greater part of Florida during late February and early March, 1932, the writer was interested in making as many observations as possible on the adult males of *C. m. major* with regard to ascertaining further information on the color of the iris. Ample opportunities were afforded, as the birds were abundant in many sections and careful records were kept as to localities and variations of the eye color. A most peculiar state of affairs resulted.

Broadly speaking, the supporters of each color (yellow and brown) are vindicated in peninsula Florida, the yellow-eyed males seeming to frequent the coastal sections, and the brown-eyed males, the interior. No mixture of the two was noticed except that, at Punta Gorda in Charlotte County, two or three brown-eyed males were noted in the great majority of yellow-eyed birds. From Jacksonville down to Titusville, as had been the experience of the writer on former trips, the males all had the yellow eye, as did those further down the coastal strip, at West Palm Beach, Pompano and Hollywood. No birds were seen south of Miami, or on the Keys, although the route did not extend below the first ferry at the southern tip of Lower Matecumbe Key. At Naples, on the west coast, the yellow-eyed birds were plainly in evidence, and also at Punta Gorda.

In the region about Orlando, south to Kissimmee, and from thence over to the east coast near Melbourne, the adult males had the brown iris. There were hundreds in evidence, feeding in the canals and ditches which bordered the road and careful study was made of many flocks at exceedingly close range. About the marshes of the upper St. John's River in Brevard Co., the same condition prevailed. About the northern and eastern shoreline of Lake Okeechobee and extending eastward to within a few miles of West Palm Beach, the brown iris was universal. Across the entire length of the Tamiami Trail until the west coast was reached, the brown iris held good. Invariably, however, the coastal strips east and west, exhibited yellow-eyed birds.

It is a most interesting and perplexing condition for which no one seems to have an explanation.—ALEXANDER SPRUNT, JR., *92 South Battery, Charleston, S. C.*

Red-winged Blackbirds Nesting in Treetops near Top of Hill.—It is twenty-five years since Red-winged Blackbirds began nesting in the tops of our trees, which grow more than half way up the hillside from a brook frequented by others of their species. Since 1907, when four females built nests at heights of eighteen to twenty-two feet from the ground in separate plum trees, there has been great increase in growth of wild currant, wild gooseberry and elderberry bushes in our house yard of about an acre in extent. In these bushes more frequently than in the tops of plum trees do the Red-wings nest. None of them has ever come to the feeding place for food. The choice for nest locations of this hillside yard has gradually and almost completely superceded that of the wet ravine where they formerly built. The species is greatly reduced in numbers. Their change of habitat may have interest for ornithologists who have observed similar changes elsewhere.—Althea R. Sherman, *National, Iowa.*

Newfoundland Crossbill at Wellesley, Mass.—On April 1, 1932, Mr. Lester W. Smith, while banding birds at Wellesley, Mass., noticed in one of his traps, a female crossbill of such exceptional size that he immediately recognized it as one of the so-called Newfoundland Crossbills, *Loxia curvirostra percna*, and very kindly collected the specimen, and presented it to the Boston Society of Natural History.

The bird was noticeably larger than the ordinary Red Crossbill, with the bill much thicker, longer, and more markedly crossed, and with the tarsus very much thicker and heavier.

The following weight and measurements, which I took with some care, may interest the readers of 'The Auk': Weight 38 gr.; Length 155 mm.; Wing 87 mm.; Bill 20 mm. (chord of exposed culmen); Depth of bill 10 mm.; Tarsus 18.5 mm.; Tail 50 mm.—Fred H. Kennard, *Newton Centre, Mass.*

Harris's Sparrow Again in Luce County, Michigan.—On May 16, 1931, a Harris's Sparrow (*Zonotrichia querula*) at McMillan, Mich., entered my trap and was banded. It was caught again the following morning but was not seen afterward. I recorded this species in the same locality on May 21, 1924 (Auk, January, 1925) but have not seen it in the interval of seven years.—Oscar McKinley Bryens, *R. F. D. 1, McMillan, Luce Co., Michigan.*

White-throated Sparrow Wintering in Cheshire County, New Hampshire.—On February 27, 1932, and also on the 28th and 29th, I watched a lone female White-throat at a neighbor's, which I was told had been coming to the yard for food during stormy or cold weather. The throat was very pale and also the crown stripes. When first seen and until it disappeared, it seemed to be in a perfectly healthy condition and was quite tame. It was observed almost daily until March 26.—Lewis O. Shelley, *East Westmoreland, N. H.*

The Winter Status of the Carolina Junco.—Apparently very little is known about the winter status of the Carolina Junco (*Junco hyemalis carolinensis*), which is usually stated as "the lowlands adjacent" to its breeding range. I took a Junco near Lexington, Va., on January 22, 1932, which was identified as *carolinensis* by Dr. Herbert Friedmann, of the U. S. National Museum. I have not been able to learn of any other winter specimen taken north of North Carolina. The fact that I had not been able to secure this form in winter previously, although it is a common breeder in the mountains nearby, led me to make some inquiries of the larger eastern museums, with some interesting results. There seem to be no winter specimens of this form at all in the U. S. National Museum, the Carnegie Museum, or the collections of the Philadelphia Academy. There are fifteen in the Brewster collection in the Museum of Comparative Zoology, and four in the American Museum, but all are from North Carolina. Dr. E. A. Smyth, Jr., in twenty years of collecting in Montgomery County, in western Virginia, found only the typical northern form in winter, although he examined many Juncos. (Auk, XXIX, 1912, p. 521). On the other hand, beyond the southern end of its breeding range, it has been found far from the mountains in winter. In the 'Second Supplement to Arthur T. Wayne's Birds of South Carolina' (Charleston Museum, 1931), Sprunt and Chamberlain say that it "winters down to the coast." They give three mid-winter coastal South Carolina records, and Mr. Alexander Sprunt, Jr., writes me that he has several other such records. In the light of the almost complete absence of records from Virginia and farther north on the one hand and of the occurrences on the South Carolina coast on the other, I would suggest the probability that there is a general migration on the part of the Carolina Junco, with a resultant scarcity in winter in the northern part of the range, a concentration in the uplands of the Carolinas, and an advance beyond the southern limits of the breeding range eastward and southward on the part of many individuals. Possibly it might also be found in central Georgia and northern Alabama. Further information on these points would be of interest.—J. J. Murray, *Lexington, Virginia.*

The Lark Bunting, an Addition to the Virginia Avifauna.—On February 11, 1932, at Cameron's Pond, near Lexington, Virginia, I had the pleasure of taking the first Lark Bunting (*Calomospiza melanocorys*) to be recorded from Virginia. As I was watching some Song and Tree Sparrows in a shallow limestone sink hole in a pasture this bird flew up from a thick tangle of briers and alighted in a bush. The buff wing patch at once caught my eye, and I soon realized that the bird was strange to me, although I had no idea what it was. After collecting it and looking it up I came to the conclusion that it was a Lark Bunting. I could not determine the sex in skinning it, and Dr. Herbert Friedmann, who has examined the bird and confirmed the identification, writes me that it is not possible to be certain as to the sex from the plumage in winter. He says that the bird is apparent-

ly an adult, judging by the hardness of the skull. The specimen has been deposited in the U. S. National Museum (No. 330128). This bird of the western plains has hitherto been reported in the east only from Massachusetts, New York, and South Carolina.—J. J. MURRAY, *Lexington, Va.*

Notes from Along the Connecticut River.—Extremely mild, snowless weather until February 4 led to occasional individuals of such species as the Hermit Thrush, White-throated Sparrow, and Field Sparrow, wintering in western Massachusetts, and a Savannah Sparrow at South Windsor, Conn. Other birds were not far south, for in the first week of March the Red-shouldered Hawk in numbers, the Kingfisher, Bluebird, Red-wing, and Bronzed Grackle, were noted; and though the second and third weeks of the month were cold, with constant high north winds, the Fox Sparrow appeared March 10 and the Killdeer March 18. Northern birds, on the other hand, were scarce: the Goshawk, for example, has been seen but twice (March 18 and April 3) and the Northern Shrike but once, March 19.

Never in our experience has there been such a migration of water-fowl. Either the short gunning-season allowed by the Federal Government preserved the lives of many, or more likely the mild winter encouraged many to linger in Long Island or eastward waters, whence they passed north or northwest across our territory.

Cygnus columbianus. WHISTLING SWAN.—The most striking visitor was a swan on Woodland Pond, Manchester, Conn. Hordes of little fishes, mysteriously killed, attracted great flocks of gulls to the pond, and on going to see them, March 23, Mr. C. W. Vibert of South Windsor discovered this swan. A great many bird-students visited it in the next four or five days and it remained until April 4. It was positively not a Mute Swan: no yellow whatever could be seen on its bill.

Other species noted have been:

Branta bernicla hrota. BRANT.—A flock of 18 appeared at South Windsor, Conn., March 13, and remained until the 25th, when they were seen in northward flight at the very moment when we, from Massachusetts, arrived. The flock then consisted of 15 birds.

Anas rubripes rubripes. RED-LEGGED BLACK DUCK.—Though at no time so common with us as *A. r. tristis*, some birds of this race were still at Porter Lake, Springfield, as late as April 16. Together, the two races amounted to over 100 birds. On April 5 at Northampton, Mr. Eliot closely approached an apparently mated pair, of which the male was *rubripes*, the female *tristis*. The drake made frequent short, low flights, for the sole purpose, it seemed, of displaying to his mate his brilliant legs.

Chaulelasmus streperus. GADWALL.—From the Ox-bow at Northampton on April 2, a duck was flushed which, because a male Baldpate was also in the flock, was supposed to be a female of that species. When the flock swung broadside, however, the lean form, blade-like wings, and sharply defined white speculum, indicated a Gadwall. Next day the male Baldpate

was still present with the Black Ducks, but not this other bird; and if she had been a female Baldpate he would scarcely have let her depart alone.

Mareca americana. BALDPATE.—We have been amazed at the numbers of Baldpates, a duck neither of us had seen here before. Ordinarily, we suppose, they migrate toward the Great Lakes from farther south; but this year from New England waters. At Forest Park, Springfield, a pair was observed March 19, and two pairs March 25. Near the swan in Connecticut that day were six birds more, and on the river at South Windsor, a flock of fifteen. A pair was seen, at Springfield on April 2, a drake was with Black Ducks at Northampton April 2–3, a pair was seen there April 14, and as late as April 20, four days later than the latest Massachusetts date given by Forbush, a flock of three males and four females was closely approached there.

Dafila acuta tzitzihoa. PINTAIL.—Except for six on the River at South Windsor, Conn., March 25, this species has been seen only at Forest Park, Springfield:—one pair March 13, three males and a female March 19, a male March 25, three pairs April 2, and one pair April 9. This is far more than usual.

Nettion carolinense. GREEN-WINGED TEAL.—The Teals' most regular resort has been a weedy pond in Belchertown, where some were sseen whenever it was visited between April 2 and 16; but the species has also been seen, in ones, twos, or threes, in four other places.

Aix sponsa. WOOD DUCK.—What was just said of the Teal holds good for the Wood Duck too. It seems less numerous than last fall, but widely distributed.

Nyroca collaris. RING-NECKED DUCK.—We have seen, or at least identified, no females, but eight males: at Northampton, one March 31, two April 2, and two April 8; at Longmeadow two and at Feeding Hills one on April 2. Why the drakes travel in pairs and without mates piques our curiosity.

Nyroca affinis. LESSER SCAUP.—We are fain to list all the Scaups we see as this species, for very seldom can we positively identify the Greater. On the River at South Windsor, March 25, the reddish purple on a drake's head was discernible (there were 12 Scaups in that flock), but otherwise the sun has not shone. Ashley Pond, Holyoke, is the only locality, and the dates are March 23, March 30 (four), April 2 (two drakes), and April 9 (a pair).

Glaucionetta clangula americana. GOLDEN-EYE.—After the Black Duck and American Merganser, this is the third commonest of the family. This year we saw unusual numbers, especially of males. Our latest date was April 9 (three pairs at Northampton, one male at Holyoke).

Charitonetta albeola. BUFFLEHEAD.—One drake was seen at Ashley Pond March 30, diving and feeding near the Scaups.

Lophodytes cucullatus. HOODED MERGANSER.—Almost as unprecedented numbers as of Baldpates have been noted. At South Windsor, one pair,

March 25; at Northampton, three males, two females, March 26; a pair March 27, two males and later two pairs March 31, and a pair April 3 and 5. At Agawam one and at Southwick two males April 4. At Belchertown a pair April 5 and for some days longer, and two females April 16; and at North Hadley two more females April 16.

Mergus merganser americanus. AMERICAN MERGANSER.—Little noted in the winter, presumably because of the profusion of open water, flocks began to increase as usual in late February, reached a peak in early April, and were noted, with fewer and fewer males, until April 20.—AARON C. BAGG, *Holyoke, Mass.*, and S. A. ELIOT, JR., *Northampton, Mass.*

Notes from the Washington, D. C. Region.—*Egretta thula thula.* SNOWY EGRET.—One seen September 1 at Alexander Island, Virginia, and four seen September 6 at Four Mile Run, Virginia, by Murray T. Donoho; eight seen September 7, two seen September 8, 1930—one collected, at Four Mile Run, by the writer. Six seen August 8 at Alexander Island, and one seen September 6 and 7, 1931 at Alexandria, along Hunting Creek, Va., by the writer.

Nyctanassa violacea violacea. YELLOW-CROWNED NIGHT HERON.—Robert Bruce Overington has in his collection the following specimens taken by him at Laurel, Maryland: male and female—June 30, male—July 14, two females—July 22, 1927.

Chen hyperborea atlantica. ATLANTIC SNOW GOOSE.—A mounted specimen of this form in the possession of Edwin B. King of Warrenton, Virginia, was recently examined by the writer. It was shot by Mr. King from a duck blind at Brent's Point, at the junction of Aquia Creek and the Potomac River, Stafford County, Virginia, November 4, 1929. This is the first known record for this area.

Stercorarius parasiticus. PARASITIC JAEGER.—George Marshall of Laurel, Md., has an immature male in his collection taken by Louis F. C. Heintz on Little River, between Analostan Island, D. C. and the Virginia shore, September 23, 1899. Mr. Heintz turned it over to Lee Young, from whom Mr. Marshall received it while the latter was taxidermist at the U. S. National Museum. This is an addition to the local avifauna.

Chlidonias nigra surinamensis. BLACK TERN.—R. B. Overington took an adult male at Laurel, Md., May 19, 1908. This is the first spring record for the region.

Dendroica cerulea. CERULEAN WARBLER.—A male was taken along the Potomac River, about two miles above Great Falls, Md., May 17, 1931, by Paul Bartsch and the writer.—W. HOWARD BALL, *1861 Ingleside Terrace, N. W., Washington, D. C.*

Notes from Chapel Hill, North Carolina.—Below are a few recent observations and records made by Edmund Taylor, Coit Coker and the writer working together. They may serve to modify or add to the previously recorded status of several species in central North Carolina.

Colymbus auritus. HORNED GREBE.—A dead specimen was found by Edmund Taylor, November 14, 1930, and is now in his collection. This is the first record of this straggler in this vicinity, and one of the few for inland North Carolina.

Tyto alba pratincola. BARN OWL.—On May 15, 1931 one was brought to the University's Zoological Department. This was the second positive record for this vicinity, though Mr. Roy M. Brown tells me that an owl which he was positive was a Barn Owl stayed in his barn much of the winter of 1930–31. He had numerous close views, and hardly any other owl would roost continually in a barn. There is no particular reason why this species should be ususually rare in central North Carolina although there are few records, most of which are in winter. Perhaps the secretive habits of this species have much to do with it.

Sitta canadensis. RED-BREASTED NUTHATCH, and *Spinus pinus pinus.* PINE SISKIN.—This winter of 1931–32 appears to be what one might call a "Siskin and Red-breasted Nuthatch winter." Both species have been observed a number of times, while in most winters they are not present. At Raleigh, N. C., for instance, in forty-five years of continuous observation the Nuthatch was observed in only fourteen winters and the Siskin in only eight.

Vermivora chrysoptera. GOLDEN-WINGED WARBLER.—There seem to be few records of this transient in central North Carolina. A single male was observed by myself on August 31 and September 1, 1930, and September 3 and 4, 1931.

Sturnella magna magna. EASTERN MEADOWLARK, and *Pipilo erythrophthalmus erythrophthalmus.* RED-EYED TOWHEE.—Both species have been in the past considered as winter visitors in central North Carolina, but were suspected of breeding. On May 15, 1931 a nest of the Meadowlark containing eggs was found by some boys near Chapel Hill, and was later examined by Edmund Taylor. Though we have no actual breeding record for the Towhee I observed a pair almost every day during June and July, 1931, the birds were apparently mated, and the male often sang.

Euphagus carolinus. RUSTY BLACKBIRD.—Though usually considered a transient here we have found it not infrequently in winter, especially during the mild winter of 1931–32. Usually fifteen or twenty birds or less compose a flock, but on January 27 and 31, 1932 I observed a flock of over 300 birds eating berries and singing in the woods. This unusually large flock was undoubtedly to be classed as already migrating north and not as wintering.

Spizella passerina passerina. CHIPPING SPARROW.—Has been practically a permanent resident this year, being observed rather commonly throughout the winter months (1931–32). This seems noteworthy in view of the fact that at Raleigh, thirty miles east of here, there is but one winter record in forty-five years of observation (1885–1930), and this is the first winter that we have found it here.—EUGENE P. ODUM, *Chapel Hill, N. C.*

Some Notes from Cumberland Island, Georgia.—During a week spent on Cumberland Island, Georgia from April 13–20, some interesting records in the migratory movements of certain species were noted. It has been nearly thirty years since any serious ornithological work has been done on this Island, owned and beautifully maintained by the Carnegie family. It presents a haven for wild-life of all forms and is one huge sanctuary where everything is protected.

Through the kindness of the Messrs. Morris Carnegie and Robert Ferguson, a small party from the Charleston Museum was privileged to spend a week there. This party consisted of Messrs. H. Jermaine Slocum, E. B. Chamberlain, Peter Gething and the writer and a list of one hundred and forty-one species of birds was obtained. Noteworthy records follow.

Olor columbianus. WHISTLING SWAN.—A pair was observed on April 17, flying above the beach near the northern end of the Island, opposite the largest of the freshwater lakes (Whitney Lake). They passed over at a low height, one behind the other, at a distance under an eighth of a mile and in brilliant sunlight. Both were seemingly adult birds, being of a uniform snowy white. They are identified as *columbianus* because of the presence of this species along the Atlantic coast, and the extreme rarity of *buccinator* everywhere.

Euphagus carolina. RUSTY BLACKBIRD.—A flock of three males and five females was watched at a distance of about thirty feet with binoculars on April 20. The birds were feeding on floating vegetation in a small lagoon, and flew up into low bushes at our approach. Since the latest date for the Charleston area is April 29, this occurrence about two hundred and fifty miles south, must be very late. A. H. Howell, in his 'Florida Bird Life,' page 432, gives April 14 as the latest date in spring for Florida.

Vermivora pinus.—A single male was noted on April 16. It evinced a tameness which allowed an approach to within eight feet. Since this warbler is, at all times, rare in the coastal sections of the southeast, its occurrence here is noteworthy.

Dendroica virens waynei.—A male in song was noted at Rhetta Lake on the 15th. This is, as far as the writer is aware, the first recorded occurrence of the bird outside of South Carolina where it is a summer resident. This substantiates the surmise that it migrates up the lower Atlantic coast from some point in the West Indies or other part of the tropics.

The peculiar behavior of a Ring-billed Gull impressed the writer as unusual during one afternoon of beach observation. Some Eastern Brown Pelicans were fishing just beyond the surf, and on several occasions a Ring-billed Gull was seen to follow a pelican in its dive, hover until it had straightened up on the surface and then proceed to alight on the back of the successful angler and endeavor to procure the catch. Once it seemed that the gull actually alighted on the pelican's head, but this may have been a hovering maneuver. However, the settling down on the back was very evident and occurred time and again, the gull remaining until the pelican took flight.—ALEXANDER SPRUNT, JR., *92 South Battery, Charleston, S. C.*

Birds Attracted to Small-flowered Leaf Cup.—During the autumn of 1931 the writer noticed that a number of birds, chiefly Carolina Chickadees were being attracted to many patches of small-flowered leaf-cup (*Polymnia canadensis* L.) growing in the wetter areas of Glen Helen, Antioch College, Yellow Springs, Ohio.

The chickadees were observed pecking at the imperfectly formed flower-heads of this rank member of the Compositae while hanging head downward from the plant, or they would first remove the flowers and carry them to nearby tree or shrub branches where they picked at the blossoms which were held on the branch with one foot.

Investigation of the flower heads of this plant showed that most of them were infected with the small striped brown larvae of one of the Noctuid moths. The work of these insects seemed to cause the blossoms to rot and turn brown. Some of the flowers showed the opening of a burrow on their distal end. On an average plant 128 blossoms and flower-buds were counted of which the majority were infested with the larvae. One tiny golden pupa and three larvae were found in one flower but the majority of the flowers had only one larva.

The identification of the plant was made by Dr. Robert B. Gordon, Botany Department of Ohio State University, who remarked: "This species usually has defective flowering development in Ohio, and I wonder if it is always due to damage by the insect larvae which you found. I have never examined the flowers to see what was wrong, but I do not recall of ever having seen a perfect head of flowers in this state."—Louis B. Kalter, *535 Belmont Park, Dayton, Ohio.*

Some Avian Uses For Mistletoe.—Mistletoe, has several uses from the viewpoint of birds, especially after it has reached the bushy stage of its growth and becomes a thick clump of from one to three or four feet in diameter.

One of these uses is to shelter nests, such species as the Nicasio Jay (*Aphelocoma californica oocleptica*), the White-tailed Kite (*Elanus leucurus majusculus*) and others having been observed in this vicinity to build their nests among this growth.

Mistletoe berries are reported as eaten by several European species (see Mayaud and Heim de Balsac in 'La Revue Francaise d'Ornithologie,' Dec. 1928, and 'Alauda,' Dec. 1930). These authors have made a study of the spread of mistletoe from tree to tree by birds which feed upon the berries,—the Missel-thrush (*Arceuthornis viscivorus*), the Blackcap (*Sylvia atricapilla*) and quite a number of other birds being reported as consumers. Without doubt many berry-feeding birds in our country eat the viscid and mucilaginous fruit,—another use for mistletoe then being the furnishing of food to such birds as will feed upon the fruit.

Still another use for mistletoe is the furnishing of sheltered roosting places to birds during the night, such as evidenced by the observation which follows. Towards the end of a Sunday field trip near Benicia, California,

about dusk on February 14, 1932, as I passed through a small grove of buckeye trees (*Aesculus californica*), in most of which were clumps of mistletoe (*Phoradendron*), a flock of seven or eight Western Bluebirds (*Sialia mexicana occidentalis*) were disturbed by my approach after having settled for the night. Investigating several of the others of these growths of mistletoe in the neighboring buckeye trees I flushed other small flocks of seven to ten bluebirds. Apparently a large flock had split up into small groups, each occupying the centers of the clumps of mistletoe. Aside from the foliage of the mistletoe these buckeye trees were practically bare, the small leaf buds at the ends of each of the trees' limbs having not yet broken open, thus leaving no protection for the birds other than the mistletoe clumps during what proved to be a fairly cold night—slightly below freezing. One might think that the heavy foliage of the live oaks close by would have furnished better protection from the cold and the wind,—but mistletoe apparently serves satisfactorily in this capacity also.—EMERSON A. STONER, *Benicia, California.*

Deposition of Eggs in Time of Snow-storm.—On June 18, 1931, the region of Churchill, Manitoba, was visited by a savage blizzard from the northeast. The temperature was not very low (about 34° F.); but the high wind was accompanied by a heavy fall of snow.

By this date, most of the summer resident species of the region were laying eggs. On June 17, the members of our expedition had many nests under observation, some with complete but most of them with incomplete sets of eggs. Near our camp at the mouth of the river were several nests of Lapland Longspurs, Horned Larks, and Semipalmated Plovers, most of them with incomplete sets.

On the morning of the 18th we awakened to find a deep drift in our tent where the wind had blown snow in through a crack in the door. The tundra was covered with six or eight inches of snow, and there were drifts many feet deep in the sheltered places.

We were greatly interested, during the following three days, in the behavior of incubating or laying birds at their nests. The snow was so deep that many birds had deserted, even in some cases where there were full sets of eggs. Semipalmated Plovers, Horned Larks, and some of the Lapland Longspurs had remained at their nests in spite of the storm, however, for we found the birds incubating in holes in the snow sometimes fully a foot deep.

Of special interest was the manner in which some of the birds deposited their eggs in the snow near their nests. A Lapland Longspur, whose nest was situated at the foot of a rocky ridge near our tent, in rather an exposed position, laid an egg on the snow almost directly above the nest at the nearest place she could reach. The egg was probably a foot from the nest. Another Longspur laid her egg in the shelter of our tent. We did not know the location of this bird's nest, but it could not have been very close by.

A Semipalmated Sandpiper laid an egg in the snow directly above her

nest. Here the snow was about seven inches deep. The nest was in the open. A Least Sandpiper, similarly, laid her egg in the snow as near the nest as she could. In fact, the snow had the appearance of having been scratched away a little, as if the bird had been trying to dig down to the nest.

A Stilt Sandpiper laid an egg in the shelter of a railway embankment, probably some distance from its nest.

A Pintail egg was found in the snow among the willow-scrub along the bank of the Churchill River. We did not find this bird's nest.

On June 21, Mr. John B. Semple found that a Tree Sparrow, whose nest he had been watching, had made a queer little accessory nest about eight inches from the original one which had been deeply covered with snow. In the new "nest" *two* eggs had been laid. The original nest contained three eggs, and after the snow had melted, the bird went back to this nest. The two eggs in the emergency nest were transferred by Mr. Semple to the original nest, but we did not have an opportunity to learn how the united family was faring.—George Miksch Sutton, *Pebble Hearths, Bethany, W. Va.*

RECENT LITERATURE.

Roberts' 'Birds of Minnesota.'—At the organization meeting of the American Ornithologists' Union in 1883, the founders elected a small number of additional members among whom was Thomas S. Roberts, even then the outstanding ornithologist of Minnesota. Ever since then when mention is made of Minnesota bird life the name of Roberts immediately comes to mind. In all these fifty years, Dr. Roberts has been accumulating a store of knowledge on the birds of his state that has seldom been equaled by a single ornithologist in any commonwealth, and for a good part of this time he has had in mind a definite idea of publishing the results of his studies. Thanks to the generosity of his friends in Minnesota this has now been accomplished and 'The Birds of Minnesota' in two volumes[1] is before us, aggregating some 1500 pages of text with 92 colored plates and a wealth of text figures.

One must study the work at first hand to realize the vast amount of information that it contains as it is impossible to do it justice in the short space at our disposal. The nomenclature and sequence is that of the new 'A. O. U. Check-List'—a wise practice since it avoids confusion on the part of the readers who in vast majority are not concerned with differences of opinion on matters of scientific names. Additional "common" names are added to facilitate identification. When two races of a species occur in the state they are usually treated together with a mention of their differences and respective ranges, but sometimes they are accorded separate treatment when the difference between them is noticeable—and after all degree of difference rather than the fact of intergradation is what the average reader is concerned with.

Under each species we find paragraphs relating to General Range, Range in Minnesota, Migration Dates and Nesting in Minnesota, as well as Nest and Eggs, Food, and Field Marks. Following this comes the main text in which the author displays his thorough mastery of the literature of the subject as well as the extent of his personal experience, judicious quotations being mingled with field observations in a most satisfactory way. While in the main the accounts are dignified histories of the species in Minnesota, the author not infrequently presents delightful little pen pic-

[1] Museum of Natural History. University of Minnesota | The | Birds of Minnesota | By | Thomas S. Roberts, M.D. | Fellow of the American Ornithologists' | Union. Professor of Ornithology and | Director of the Museum of Natural History | University of Minnesota | Illustrated with Ninety-two color plates by | Allan Brooks. George Miksch Sutton. | Walter Alois Weber. | Francis Lee Jaques | Walter John Breckenridge. Including one | plate by the late Louis Agassiz Fuertes | Volume I | [vinette] | Minneapolis | The University of Minnesota Press | London. Humphrey Milford. Oxford University Press | 1932 Pp. i–xxii + 1–691, pll. 1–49 and frontispiece figg. 1–298. Vol. II, pp. i–xv + 1–821. pll. 50–90 and frontispiece, figg. 299–606. Price for the two volumes $6.00. There is also a limited de luxe edition numbered and signed by the author and bound in a special binding designed by William A. Kittredge; price $25.00.

tures of the bird and its surroundings which add greatly to the enjoyment of the reader, while following each account is a well selected series of references to books and papers in which he may find additional information on the species in question. Under the ordinal and family headings, moreover, is presented much general information about the group as a whole.

The introductory chapters are very full and cover 'An Historical and Bibliographical Review of Ornithology in Minnesota' (18 pp.); 'Acknowledgements' (8 pp.); 'Geography of Minnesota' (23 pp.), including topography, forest distribution, rainfall, etc.; 'A Synopsis of Bird Life of Minnesota' (34 pp.), covering changes in the fauna, time of occurrence, migration, life zones etc.; 'Conservation' (34 pp.)—bird protection, refuges, economic ornithology, mortality among birds, disease etc.; a chapter on 'Bird Banding' by F. C. Lincoln, and 'General Comment and Explanations.'

At the close of Vol. II is a key to Minnesota birds with elaborate descriptions of all plumages (273 pp.)—really a book in itself—and a bibliography of Minnesota ornithology (58 pp.) arranged chronologically.

After a perusal of Dr. Roberts' work we find it difficult to suggest any possible features lacking in the scope which the author has planned and to which he has evidently given long and careful consideration.

The only criticism that we can offer is the unfortunate weight of the volumes due to the use of sized paper for the text, and as most of the text figures are line drawings it would seem that light weight paper might have been used.

Like most recent state bird books, colored figures of all the birds are presented on the plates with the addition, in the present instance, of male and female where their plumages differ, as well as the juvenal plumage, aberrant and molting plumages. This as always necessitates much crowding on the plates which is the despair of the bird artist. The plates are all reproduced by the offset process which permits the printing on unglossed paper and the effect is particularly pleasing, while the coloration is remarkably accurate except in a very few cases—the Savannah Sparrow, for instance, seems much too gray. Personally we prefer plates that cover the entire page rather than with a broad white margin as in the present case, but that may be a matter of individual opinion, certain it is that these plates are very beautiful.

Instead of depending upon the talent of one or two artists, Dr. Roberts has enlisted the services of a much larger staff; Allan Brooks is responsible for 36 plates; Walter A. Weber, 27; W. J. Breckenridge, 14; F. L. Jacques, 8; George M. Sutton, 4; and the late Louis Agassiz Fuertes, 1. This has great advantage in presenting variety of treatment but since each artist has usually limited his work to special groups it is difficult to make comparisons! Major Brooks' long experience has taught him many points in composition and his plates of Swallows and Kinglets are particularly pleasing while the plan of presenting several individual groups on a single plate after the manner of Thorburn, which he has used in the case of the birds of prey and the wrens, is very attractive, while his ducks are, as always, beautifully

done. Jacques' herons have a Japanese quality that is original and appealing, while Breckenridge's shore birds give promise of excellent work in this field. Weber seems to have had the hardest allotment in the bulk of the passerine birds with an enormous number of figures and the necessity for much crowding. It is a pity that some method cannot be devised whereby our many excellent bird artists may portray a single species on a plate and show their real artistic ability without being forced to include so many species on a page which makes artistic treatment impossible. This is no criticism of Dr. Roberts' artists but merely a plea for the future!

Thanks to Dr. Roberts, Minnesota now has a bird book in keeping with its varied and interesting bird life and bird study and conservation throughout the state will, we feel sure, be vastly stimulated by it, while ornithologists elsewhere will have an invaluable work of reference and those who form ornithological libraries another beautiful work to place on their shelves. We congratulate Dr. Roberts upon the completion of what has been in fact, his life work and which he has carried through in spite of the constant demands for many years of a busy medical career. To the friends who have made the publication possible, ornithology is also much indebted. —W. S.

The Birds of Louisiana.—Louisiana made famous by Audubon as a bird paradise has until now lacked a state "bird book." Mr. Stanley C. Arthur for some years director of the Wild Life Division of the Department of Conservation was known to be at work upon such a volume[1] and at the time of his severance from this position it was understood to have been nearly completed. With the remarkable political history of the state in recent years the fate of the work has been in doubt but at last it has appeared without any designation of an author, although it is stated in the introduction, by the Commissioner, that "the data has been especially gathered by Stanley C. Arthur" while in the unsigned preface he is cited as having been "particularly helpful in rendering assistance"! From other sources we learn that he was not allowed to revise the manuscript in order to bring it into accordance with the new A. O. U. 'Check-List' and was not even furnished with proof sheets.

The main text, which we take to be the work of Mr. Arthur, is excellent, presenting good descriptions of the birds and their habits with much information on their economic status—just what such a work should contain to provide educational matter for the use of the schools and the public at large. A number of excellent color plates were furnished by the National Association of Audubon Societies and the Biological Survey from their several publications while there are many text figures from these and other sources and some apparently original.

[1] State of Louisiana | Department of Conservation | Rob't S. Maestri, Commissioner | Bulletin No. 20 | The Birds of Louisiana | (seal) | Published by the | Department of Conservation | New Orleans Court Building | August, 1931 | [received April 1, 1932.] Pp. 1–598. Sent on receipt of 25 cents in stamps to defray postage; Dept. of Conservation, 126 N. O. Court Building, New Orleans.

Those who have been responsible for the publication of the work have produced some remarkable and confusing errors. While it is stated that the nomenclature is that of the A. O. U. 'Check-List' it is in reality not that of any known Check-List. Not only have many changes in names been made that were deliberately rejected by the A. O. U. Committee but genera are recognized which do not occur in the classification which we are told was followed, and some remarkable trinomials are presented for the edification of the readers as for instance "*Melanerpes erythrocephalus stet*" *Phloeotomus pileatus stet*, and "*Chae tura pelagica*." The so-called "key" to the families of perching birds constitutes a puzzle worthy of the serious attention of a cryptogram expert, to which the printer in spacing and punctuation has added not a little. We fear the "key" will not unlock the treasury which lies beyond!

As a contribution to food habits we learn that the Pintail Duck eats "an amazing number of *Xyzpdq* seeds." This we think will be news to Mr. McAtee who is quoted for the major part of the information on the food of this species! Some of the illustrations have been strangely misplaced: the Ruby-crowned Kinglet text is illustrated by a figure of the Golden-crown; the two Mergansers have been transposed and a picture of Gannets adorns the account of the Cormorants.

All of this is proof of the danger of entrusting the publication of a semi-scientific book to editors and proof readers who are apparently unqualified for the work in hand. Let us hope that a revised edition of what is really a most important publication may be authorized and that the revision be placed in the hands of Mr. Arthur.

We congratulate him upon the excellent work that he did in preparing this report in the first place and regret that it has been marred by errors which are obviously not of his making.—W. S.

Cayley's 'What Bird is That?'—Mr. Neville W. Cayley, the well-known Australian ornithologist and bird artist, has written a guide[1] to the birds of his country which seems to be just what the bird-loving public of Australia desired, since we learn that a second edition of the book was required within a month.

The work consists of thirty-six color plates containing small numbered figures of the birds from paintings by the author, sometimes as many as thirty-two to a plate; a text correspondingly numbered presents the names of the birds with their derivation; the distribution of each species; notes on habits and accounts of nest and eggs.

The species are not arranged systematically but by habitat—Forest Birds, Birds of the Heath Lands and Open Country, Birds of the Lakes,

[1] What Bird is That? | A Guide to the Birds | of Australia | By | Neville W. Cayley | Vice President of the Royal Zoological Society of New South | Wales; Member of the British Ornithologists' Union and | Member of the Royal Australasian Ornithologists' Union | Illustrated by the Author| Australia | Angus & Robertson | Limited | 89 Castlereagh Street, Sydney | 1931. Pp. i–xx + 1–319. Price 12 shillings, 6 pence.

Streams and Swamps and Birds of the Ocean; with further ecological divisions on the several plates. There are also fourteen photographs of habitats and a map. When we learn that some 700 species are treated (exclusive of subspecies which are not considered) we realize not only the wealth of the Australian avifauna but also the gigantic task that the author has so successfully completed.

There is only one omission—one that American bird students have been quick to recognize i. e. no mention whatever of Dr. Frank M. Chapman's book of the same title published in 1920, and treating of American birds. Not only is the title of Mr. Cayley's book the same but the same red question mark adorns the cover while there is the same idea of many small figures on a plate and the same reproductioon of a foot rule with each plate to indicate the size of the birds.

It would seem impossible that all of these similarities should originate independently in two minds, and in view of the wealth of other acknowledgements in the preface some word of indebtedness to Dr. Chapman for the inspiration that prompted these admirable popular features would seem to have been in order.

Mr. Cayley's book will, we are sure, prove a most valuable aid to popular bird study in Australia as well as a welcome guide for the visiting ornithologist and an important hand book in any ornithological library.—W. S.

Brown's 'My Animal Friends.'—The Philadelphia Zoölogical Garden is well known as one of the earliest "zoos" in America and one in which a remarkably complete exhibition of animals has always been maintained. The present attractive volume[1] by C. Emerson Brown, director of the Garden, is based largely upon its collections and upon Mr. Brown's experiences in caring for his "wards."

It contains interesting accounts of the various species of animals usually found in captivity and some of the rarities in the Philadelphia collection, notably the wonderful series of anthropoid apes. There are also chapters on the care of animals in zoological gardens, their feeding and health—chapters which well-meaning critics of "zoos" would do well to read! There are also many excellent illustrations from photographs of the animals in the Garden.

While the work is mainly devoted to mammals there are several chapters on birds and one on reptiles. The book is interesting and instructive reading and will prove a most welcome guide to those whose experience with wild animal life is of necessity limited to zoological gardens.—W. S.

Coble and Life's 'Introduction to Ornithological Nomenclature.'—This little book[2] is not, as its title might imply, a synopsis of the rules

[1] My Animal Friends | By C. Emerson Brown, C. M. Z. S. | Director, Philadelphia Zoological | Garden | Doubleday, Doran & Company, Inc. | Garden City, New York | 1932. Pp. i–xiv + 1–262. Price $3.50.

[2] Introduction to Ornithological Nomenclature. By Mary Ferguson Coble, M.A. and Cora Smith Life, M.A. Wm. B. Straube Printing Co., Los Angeles. Pp. 1–91. Price $1.00 [1932].

of zoological nomenclature but merely a discussion of the Latin terms that have been employed in naming the birds of our western states, which the authors tell us are "hard to understand and harder still to pronounce." They, therefore, explain for us the origin and meaning of the terms showing their derivation either from Latin words or from the names of persons and localities and their pronunciation.

Unfortunately there are two methods of pronouncing Latin words and both are given although among scientists the so-called "Latin" method, at least in its pure form, is rarely used. Would it not have been better to have adopted the "English" method throughout and thus helped to create uniformity, something that is sadly needed?

The generic and family names are arranged alphabetically with the species under them which necessitates many repetitions which could have been avoided had *all* the names—generic, specific, etc., been arranged in one alphabetical series. As the work deals only with names why should it be systematic? Some of the abbreviations are by no means clear as the oft-repeated "Lat. same"; for example under the Flicker we find "*borealis* Lat. same, northern, Boreal Flicker." A little more explanation would have been helpful. Curiously enough we find "Murrelet" listed with the Latin names though we look in vain for "Auklet" or any other English word.

The above are merely suggestions which would seem to us improvements in a work which should be very welcome to those not acquainted with Latin though many will ask why should such persons bother with the scientific names of birds at all, It is really only those engaged in purely technical investigations that must use them and we welcome the tendency to give them only secondary consideration in popular books or to drop them altogether.

Unfortunately the Latin names in very many cases do not give any clue to the characters of a bird. The Robin is named *migratorius* although it is the least migratory of our thrushes and the Blackburnian Warbler "*fusca*" because the brilliant orange throat in the painting upon which the description was based had faded to dull brown!

There are quite a few typographical errors in this little book which is almost inevitable in such a compilation, but more serious errors occur in the list of personal names which precedes the main list. For instance "*couchi*", at least as applied to the genus *Tyrannus*, refers to Lt. D. N. Couch of the U. S. Army (1858) not to Leo K. Couch, while "*merriami*" as used in names of recent birds refers to Dr. C. Hart Merriam not to Dr. J. C. Merriam, although the latter has had fossil birds named in his honor. William S. Vaux's first name has been omitted, few if any of his friends knew what his middle letter stood for, and there seems to have been a general mix-up in the Scotts, Major General Winfield Scott who died ten years before the A. O. U. was founded hardly was able to be "active" in its work, and "Bewick" by the way should be pronounced "Buick," and "Giraud," "Gir-eau", the general practice among ornithologists being to

pronounce the Latin genitives the same as the owners of the names pronounced them. These slips, however, can easily be corrected in a future edition.—W. S.

Griscom's 'Distribution of Bird-Life in Guatemala.'—The late Dr. Jonathan Dwight acquired, mainly through the able field work of A. W. Anthony, a representative collection of Guatemalan birds upon which he planned to report in association with Ludlow Griscom. This plan, however, was never carried out and after Dr. Dwight's death Mr. Griscom undertook the work alone, the collection, now the property of the American Museum of Natural History, having been placed at his disposal. His completed report[1] is now before us.

The author's previous experience in Panama and other countries of Central America, together with a short visit to Guatemala, admirably fitted him for his task and he has produced a most satisfactory volume, following the model established by Dr. Frank M. Chapman in his reports on the birds of Colombia and Ecuador.

As we turn the pages we find abundant speculation on the origin of Central American bird life; on the formation and extent of the life zones of Guatemala with lists of characteristic species; on the results of migratory movements; and even on the question of the origin of species—which make interesting reading and furnish much food for thought. Following this is an annotated list of the 736 species and subspecies so far recorded from Guatemala with field observations on those represented in the Dwight collection. The synonymy under each form includes references to all publications dealing with Guatemala with lists of localities, while the ranges of both species and subspecies are given. A number of illustrations depict characteristic scenery of the several life-zones and add much to the value of the report.

Mr. Griscom emphasizes the richness of the Guatemalan avifauna—for the country is not larger than the state of New York and only about one sixth the area of Ecuador. He attributes this abundance of bird life to the antiquity of the country geologically, its position between two great zoological regions, and the survival of certain pre-glacial elements; as well as the arrival of northern forms during the pleistocene and of tropical elements during post glacial times. He points out the fact that the mountains are of great geological antiquity, unlike the recent upheaval of the Andes, and emphasizes the indirect effect of the glacial epoch in affecting enormous migrations and in lowering temperatures so that upper life zones must have been brought down to sea level with probable extermination of many of the older types. Recent geological studies, he shows, have demonstrated that no elevation of more than 1000 ft. ever existed at Panama so that the so-called "Panama Fault" brought about through submersion of part of a

[1] The Distribution of | Bird-Life in Guatemala | A Contribution to a Study of the Origin | of Central American Bird-Life | By Ludlow Griscom | Bull. Amer. Mus. Nat. Hist. Vol. LXIV, May 7, 1932. Pp. i–ix + 1–439. 11 figures and 4 maps.

continuous mountain chain and causing a break in the range of various subtropical species, as advocated by Chapman, would seem to be impossible. The origin of these similar or identical forms of bird life in the subtropical zones of South and Central America he explains through the existence of wide ranging tropical rain forests and the effect of glaciation upon the range of species of both the tropical and subtropical faunas.

Mr. Griscom's report presents many problems upon which zoögeographers may work and has paved the way for a better knowledge of the avifauna of Central America of which, curiously enough, we seem to know less than that of the more remote South American countries.

While others may not agree with all of his deductions, we congratulate him upon an excellent piece of faunistic work.—W. S.

McAtee on Protective Adaptations.—Mr. McAtee has already published his reasons for doubting the efficiency of warning and cryptic coloration in protecting animals from their enemies (Proc. Acad. Nat. Sciences Phila., June 12, 1912, pp. 281–364), and in the present paper[1] he carries the matter further. He points out that the advocates of this theory now rest their case almost wholly on the reaction of birds to protective adaptations in insects admitting that in the case of predators belonging to lower groups of animals they have no appreciable effect.

Therefore he considers the food of Nearctic birds; demonstrating in group after group that birds are influenced in the selection of their food by availability rather than by the presence or absence of any protective or mimicing device. The author's investigations on the food habits of birds, as a member of the U. S. Biological Survey, are used as a basis for his discussion and in each family of insects or other animals the number of identifications in stomach analysis are given with the percentage of each to the entire number of identifications in the order in which the family is included, as well as the percentage of species in this family as compared to the entire number of species in the order. The identifications of lepidoptera in bird food total about 18,000 and of coleoptera 85,000 so that one can appreciate the vast amount of data upon which our author's conclusions are based. As he says: "the most outstanding feature of the records of the animal food of nearctic birds undoubtedly is the marvellous distribution of them through the phyla, orders, and subordinate systematic groups. Within size limits, animals of practically every kind accessible to birds are preyed upon" and further: "the combined attack of birds plus all other predators still more closely approaches complete indiscriminancy. In other words there is utilization of animals of practically every kind for food approximately in proportion to their numbers. This means that predation takes place much the same as if there were no such thing as protective adaptations. And

[1] Effectiveness in Nature of the So-called Protective Adaptations in the Animal Kingdom, Chiefly as Illustrated by the Food Habits of Nearctic Birds. By W. L. McAtee, Bureau of Biological Survey, U. S. Department of Agriculture. (Publication 3125) Smithsonian Miscellaneous Collections. Vol. 85, No. 7. March 15, 1932. Pp. 1–201, with a subsequently published erratum for p. 56.

this is only another way of saying that the phenomena classed by theorists as protective adaptations have little or no effectiveness." There is abundant discussion in each section of this paper with quotations from published works and refutation of theories advanced.

While the principle of protective coloration has in many cases been accepted without question we have often felt that there were too many exceptions to the rule. Quite aside from the problem of insects being protected from birds we have the oft quoted illustration of the bark-like coloration of the Brown Creeper as a protection presumably against hawks, but the conspicuously colored nuthatch with almost exactly similar habits apparently gets along just as well!

Mr. McAtee has compiled a most valuable contribution to this much mooted question and we do not see how any flaws can be picked in his argument or conclusions. A good bibliography completes the paper.—W. S.

deSchauensee on the Birds of Southwestern Africa.—During the summer of 1930, Mr. R. M. deSchauensee, Research Associate of the Ornithological Department of the Academy of Natural Sciences of Philadelphia, conducted an expedition through southwestern Africa and across the Kalahari Desert to Rhodesia. He was accompanied by his wife and Messrs. A. Reginald Allen and Wharton Sinkler of Philadelphia with Mr. George Saunders as taxidermist. A collection of 558 bird skins was secured representing 254 species of which six proved to be new.

The present paper[1] is a report on the collection consisting of an annotated list with an account of the itinerary and a discussion of the distribution of the birds of southwestern Africa, which seemed to the author to be mainly dependent upon rainfall. There are a number of plates from photographs taken on the trip, illustrating the various habitats, and several maps. Two colored plates represent the bustard *Heterotetrax rupelii*, a hornbill *Lophoceros williaminae* and a flycatcher *Bradornis hererose* the last two previously described by the author.

One new form *Zosterops senegalensis quanzae* (p. 198) is described in the present paper from Quanza River, Angola.

This paper is an important contribution to the ornithology of this interesting region and the collections made by the expedition have all been presented to the Philadelphia Academy.—W. S.

Armstrong's 'Birds of Samoa.'—This little book[2] is termed a "Handlist" and its object is to enable visitors and residents to recognize the birds of the islands and record their habits "before the march of time and progress has denuded the hills of bush, thus bringing about the inevitable destruction of its bird life."

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[1] A Collection of Birds from Southwestern Africa. By Rodolphe Meyer de Schauensee Proc. Acad. Nat. Sci., Phila. Vol. LXXXIV, 1932, pp. 145–202, May 21.

[2] Hand-List to the Birds of Samoa. By John S. Armstrong, M.B. London, John Bale, Sons & Danielsson, Ltd., 83–91, Great Titchfield Street, W. 1, 1932. Pp. i–iv + 1–91. Price 8 shillings.

The book consists of rather lengthy descriptions of the sixty-three birds known from the islands mainly compiled from the 'Catalogue of Birds in the British Museum.' There are also some very brief notes and a short preface. It is regrettable that full accounts of the habits of the birds are not presented as a "popular" bird book of the right sort might go far to arouse interest in Samoan bird life and ward off the destruction that the author seems to think inevitable.

The little book is well printed and there are keys to the species included in the various orders and a bibliography.—W. S.

Mrs. Twining's 'Bird Watching in the West.'—We have had an abundance of popular bird books dealing with the familiar birds of the East but in the West until lately the concern of bird students has been with the more serious side of ornithology. Mrs. Twining, however, stands for the growing army of bird lovers both in the East and West, who delight in the bird as a part of nature; furthermore she possesses the ability to express in print her feelings about birds and to picture bird doings that have come under her observation in a way to give pleasure to others of kindred tastes.

The sketches,[1] twenty-nine in number, are arranged in four parts covering the four seasons and to give an idea of the topics we quote from the Autumn section: "Adventures in the Air; From Zone to Zone; The Little Songs of Autumn; Flocks of the Wayside; Robins and Jaybirds; Waxwing Flocks; and Bird Visitors from Mountain Forests."

They deal mainly with the vicinity of her home near Portland, Oregon, but the species are many of them widely spread while an appendix with lists of birds for the western national parks and other spots extends the interest of the book.

There are a number of little pen sketches by way of illustration.

The author says in the preface "I have tried to put into words something of the intrinsic charm of the birds themselves" and "to write about the birds I know the best to the end that those who read may better understand all birds." We think that she has succeeded admirably and her little book should attract a large number of readers.—W. S.

Cassinia for 1929–30.—Financial pressure has made the announcement on the cover of 'Cassinia' somewhat inconsistent as it has, of late years, been a biennial rather than an annual; and for some reason the stated scope "Pennsylvania, New Jersey and Delaware" has in this number been extended to include North Dakota! However, the character and interest of the publication[2] are amply upheld. There is a biographical sketch of the late Spencer Trotter; an account of southern herons in New Jersey by Chas.

[1] Bird Watching in the West. By Frances Staver Twining (Member, Cooper Ornithological Club). Illustrations by Florenz Clark. 1931. Metropolitan Press, Publishers, Portland, Oregon. Pp. 1–170. Price $2.00.

[2] Cassinia. Proceedings of the Delaware Valley Ornithological Club. No. 27 1929–30, March 1932. Pp. 1–72. Price $1.00.

A. Urner; of ducking on the Susquehanna flats by J. Fletcher Street; a series of data on the nesting of the Hummingbird for fourteen years, often several nests a year, at Fairville, Pa.; and the usual migration report now continued for a period of thirty years; also the abstract of proceedings of the Delaware Valley Ornithological Club and a bibliography. The activity of the Club is evidenced by the fact that in the two years covered by this number there were thirty-two meetings with an average attendance of thirty-six.—W. S.

Illinois Audubon Bulletin, 1932.—This attractive publication maintains its high standard and interest. The present number[1] contains among other articles an excellent illustrated account of "Flashlights of Birds," by Tappan Gregory; "Island Bird Life," by W. I. Lyon, describing the terns of Lake Michigan; "Gathering Field Notes for Bird Paintings," by Walter A. Weber; together with local reports and many good illustrations. There is so much real ornithology in these "Bulletins" that they should be in every ornithological library.—W. S.

Economic Ornithology in Recent Entomological Publications.—Entries suitable for this heading seem scarcer than formerly, and only the four following have come to notice in the last two years.

Sugar-beet weevil (*Bothynoderes punctiventris*).—This insect described as the most dangerous pest of sugar beets in the Balkan region of Europe has been carefully investigated in Czechoslovakia. The study of its natural enemies reveals birds as the most important among predators. Stomach analyses done by Dr. O. Farsky showed that crows, jackdaws, jays, magpies, gulls, starlings, partridges, and pheasants are the most effective destroyers of the pest.[2]

Lesser migratory grasshopper (*Melanoplus atlanis*).—This is the species principally concerned in destructive grasshopper outbreaks in Montana and North Dakota, but one which is injurious also in many parts of a very extensive range. Like all grasshoppers it is freely eaten by predators. The following is said[3] of its bird foes: "The most important predatory enemies of this insect in Montana are the Lark Bunting (*Calomospiza melanocorys*), Western Meadowlark (*Sturnella neglecta*), Sparrow Hawk (*Falco sparverius*), Sage Hen (*Centrocercus urophasianus*), Sharp-tailed Grouse (*Pediocetes phasianellus*), and domestic turkeys and chickens. Of these the most important is the Lark Bunting, which is very abundant on the prairie lands. Swarms of grasshoppers can often be located by the presence of large numbers of these buntings. The Bureau of Biological Survey has found specimens of this locust in the stomachs of 24 species of birds."

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[1] The Audubon Bulletin. No. 22, 1932. Pp. 1–64. Illinois Audubon Society. c/o Chicago Acad. Sci., Clark and Center Sts., Chicago.

[2] Rozsypal, Jan., The Sugar-beet pest, *Bothynoderes punctiventris* Germ. and its natural enemies, Bul. l'Ecole Sup. d'Agron., Brno, C, 16, 1930, p. 89.

[3] Shotwell, R. L., A study of the lesser migratory grasshopper, Tech. Bul. 190, U. S. Dept. Agr., July 1930, p. 27.

Great Basin wireworm (*Ludius pruininus* var. *noxius*).—This insect consistently causes losses to the wheat crop of the Pacific Northwest running into several millions of dollars annually. The natural enemies appear to be few and among them: "Birds are fairly effective enemies of the beetles of this wireworm during its emergence period in the spring. Examination of the stomach contents of birds collected during the period of adult emergence has revealed remnants of great numbers of beetles. Any means of protecting and increasing the abundance of bird life in the dry-farming areas is to be highly commended, especially in the case of the Columbian Horned Lark (*Otocoris alpestris*), commonly called 'wheat bird' or 'dust bird.' This native bird is found over nearly the same range as the Great Basin wireworm, and nearly all of the stomach contents of these birds examined during the spring emergence of the wireworm adults showed that they contained remnants of from 1 to 30 of these beetles. The Bureau of Biological Survey reports that 40 species of birds are known to feed on species of the genus Ludius, to which the Great Basin wireworm belongs, and that in general birds prey freely upon wireworms and their parent click beetles."[1]

White-pine weevil (*Pissodes strobi*).—This weevil has become increasingly injurious as plantings, especially exclusive plantings, of white pine have been made. It has numerous parasites and predators and among the latter birds get very honorable mention. "The value of birds as an aid in preventing the increase of the white-pine weevil through destruction of the larvae was shown very strongly during the summers of 1926 and 1927. In every place visited the writer found that large numbers of leaders had had the bark stripped from the wood by birds, and the larvae contained therein had been eaten by them or had dropped to the ground to die or to be eaten by the various ground-feeding species of birds and rodents which are numerous in the stands. In practically all the leaders examined (several hundred) all the larvae which had been feeding at the time the bark was stripped had been destroyed. Many of the pupae, in addition, had been picked out of their chambers. The birds observed were the White-breasted Nuthatch, Downy Woodpecker, Chickadee, Rose-breasted Grosbeak, and certain unidentified warblers. McAtee reports that the Bureau of Biological Survey has records of the Yellow-billed Cuckoo, English Sparrow, and Bluebird feeding on this pest. Hopkins reported the Downy Woodpecker in 1907, and Felt reported this same species in 1913. Forbush in 1913 also reported this species and the Chickadee. Taylor states that 17 or 18 per cent of the larvae in 3,009 infested shoots were destroyed by birds and that the birds were 'about 29 per cent effective in attacked shoots.' Graham reported the partial check of the weevil in one plantation in New York by allowing chickens to run among the trees, and suggested the possibility of destruction of the weevils by ground-feeding birds."[2]—W. L. M.

[1] Lane, M. C., The Great Basin wireworm in the Pacific Northwest, Farmers' Bul. 1657, U. S. Dept. Agr., Feb. 1931, pp. 5–6.

[2] MacAloney, H. J., The white-pine weevil, Circ. 221, U. S. Dept. Agr., May 1932, p. 19.

Shorter Articles.

Bailey, Alfred M. and Dickinson, Francis R.—The Woodcock. (*Natural History*, XXXII, No. 3, May–June, 1932.)—Photographing experiences with beautiful illustrations.

Berry, John.—Birds Seen in Western Caithness, Autumn, 1931. (*Scottish Naturalist*, No. 194, March–April, 1932.)—Photographs of migrating flocks of Snow Buntings at Strathy Point, Scotland, Nov. 30, 1931.

Bertelsen, A.—Notes on the Avifauna of West Greenland between 60° and 77° N. lat. (*Meddelelser om Groenland*, Bd. 91, Nr. 4, 1932, pp. 1–73, 2 plates.)—Forty-one species are listed with much discussion under each as to range, etc. There is a great difference in the number of species present in winter at the two extremes of the area under consideration, only five at lat. 77° while 21 winter at lat. 68° with a corresponding difference in the extent of migratory movements. (In Danish with an English summary.)

Borobieva, C.—Observations of the Migration of Birds in the Environs of Jakoutsk, Russia, during 1927 and 1928. (*Ann. Mus. Zool. Acad. Sci. URSS*, XXXII, No. 2, 1931, pp. 157–210.)—Data on 122 species with tables, temperature curves, and several illustrations. [In Russian.]

Carr. William H.—Trailside Crows and Others. (*Natural History*, XXXII, No. 3, May–June, 1932.)—Experiences with pet crows.

Elliott, Charles Newton.—Feathers of the Okefenokee (*American Forests*, April, 1932.)—Much about birds with excellent photographs.

Friedmann, Herbert.—Two Birds New to Science from Great Namaqualand. (*Proc. Biol. Soc. Wash.*, Vol. 45, pp. 65–66, April 2, 1932.) *Erythropygia coryphaeus abboti* (p. 65) Berseba, S. W. African Protect.; *Poliospiza albogularis sordahlae* (p. 65) Mt. Brukkaros, S. W. Africa.

Friedmann, Herbert.—The Birds of St. Lawrence Island, Bering Sea (*Proc. U. S. Nat. Mus.*, Vol. 80, Art. 12, pp. 1–31, pls. 1–6, 1932.)—This paper while inspired by a collection made on the island by Henry B. Collins, Jr., who visited it in the interests of anthropology, developed into a complete list of the birds recorded from the island, sixty-one in number. There is a full synonymy of local records and much information regarding molt, etc., with a number of interesting photographs.

Friedmann, Herbert.—The Parasitic Habit in the Ducks, A Theoretical Consideration. (*Proc. U. S. Nat. Mus.*, Vol. 80, pp. 1–7, 1932.)—An extremely interesting paper. It is shown that many ducks are careless in occasionally dropping their eggs in the nests of other duck species; that the Black-headed Duck of Argentina (*Heteronetta atricapilla*) is wholly

parasitic, laying in the nests of coots, ducks, limpkins, and even hawks. The Ruddy Duck and other Erismaturae are rather frequent layers in other nests and appear to be approaching parasitism, while they also are careless in incubation. Their eggs moreover, like those of *Heteronetta* are larger than those of other ducks in whose nests they lay and are large in proportion to the size of the bird. Moreover, they seem to possess a faculty of developing heat as the embryo grows, which may take the place of heat induced by incubation. All of these data together with the loss of the nest building habit constitute suggestive facts in connection with the origin of parasitism.

Grimes, S. A.—Notes on the 1931 Nesting Season in the Jacksonville Region (Florida). (*Florida Naturalist*, Vol. V., No. 2–3, Jan.–April, 1932.)

Hausman, Leon Augustus.—The Sylvids and Flycatchers of New Jersey. (*Bull. 531 N. J. Agricultural Exper. Station*, New Brunswick, pp. 1–32, Dec. 1931.)—This little pamphlet is another of the series being prepared by the author and consists of descriptions with accounts of food and habits, and illustrations reproduced from various publications. Those of the Acadian and Yellow-bellied Flycatchers had better have been omitted since they bear no resemblance to these birds in posture and look more like Kinglets.

Hicks, Lawrence E.—Progress Report of Ohio Upland Game Bird Research. (*Trans. Eighteenth American Game Conference*, 1931.)—Winter feeding and refuges discussed.

Hicks, Lawrence E.—Ohio Game and Song Birds in Winter. (*Bull. Bureau Sci. Research, Div. Conserv. Ohio Dept. Agr.*, Vol. I, No. 2. January, 1932.)—Discusses winter feeding, shelter, etc., with lists of food plants, list of habitats and list of all birds recorded from Ohio in winter, 159 in number.

Jourdain, F. C. R.—The Truth About the Kite. [Privately published.] An explanation showing that the destruction of the Kite in Great Britain as well as of many other raptorial birds is due to the efforts of the game breeders and not, as claimed by some, to egg and skin collectors. We seem to be repeating the experience of England in the United States today. For many years egg collecting went on unchecked with little or no effect on the abundance of the raptores, except perhaps of the Osprey, but once the game breeders took a hand the extermination went ahead by leaps and bounds and apparently our hawks today do not stand a chance of survival.

Kuerzi, John F.—A Mid-Summer Reconnaissance of Old Gaspe. (*Natural History*, XXXI, No. 2, March–April, 1932.)—Photographs and description of the Gannets of Bonaventure.

Lewis, Harrison F.—Notes on Bohemian Waxwing. (*Canadian Naturalist*, XLVI, No. 4, April, 1932.)—An invasion of the valleys of the Ottawa, and St. Lawrence Rivers, winter 1930–31.

Lowe, Percy Roycroft.—Struthious Remains from China and Mongolia. (*Palaeontologia Sinica, Series C.* Vol. VI, Fasc. 4. Geol. Survey of China, Peiping, 1931. Pp. 1–47, pll. I–IV)—*Struthio wimani* (p. 18), *S. anderssoni* (p. 28) and *S. mongolicus* (p. 34) are described as new, the two latter apparently wholly from egg shells!

Maslowski, Karl and Dury, Ralph.—Catalogue of the Charles Dury Collection of North American Birds. (*Proc. Junior Soc. Nat. Sci.*, 312 Broad St., Cincinnati, Vol. 2, No. 4. Oct.-Dec., 1931.)—Records from Ohio, Kentucky, Indiana, Texas, Florida, New Mexico and Colorado.

Mayr, Ernst.—Birds Collected During the Whitney South Sea Expedition, XVIII. Notes on Meliphagidae from Polynesia and the Solomon Islands. (*Amer. Mus. Novitates*, No. 516, Feb. 17, 1932.)—Four new forms described and several genera redescribed and relationships discussed.

Mayr, Ernst.—Ibid. XIX. Notes on the Bronze Cuckoo *Chalcites lucidus* and its Subspecies. (*Amer. Mus. Novitates*, No. 520, April 8, 1932.) —*C. l. harterti* (p. 8) Rennell and Bellona Islands.

Mayr, Ernst.—Ibid. XX. Notes on Thickheads (*Pachycephala*) from the Solomon Islands. (*Amer. Mus. Novitates*, No. 522, April 18, 1932.)—Five new forms are named with detailed discussion of plumages and range of others.

Mayr, Ernst.—Ibid. XXI. Notes on Thickheads (*Pachycephala*) from Polynesia. (*Amer. Mus. Novitates*, No. 531, May 28, 1932.)—Eight new races described

Mayr, Ernst.—Birds of the Saruwaged and Herzog Mountains, Northeastern New Guinea. (*Mitteil. Zool. Mus. Berlin*, Vol. 17, Heft 5, pp. 639–733, December, 1931.)—Dr. Mayr's collection on the first range numbered 272 species and their study resulted in the description of 37 new forms. In the second collection eighty species were represented of which eight races were described as new.

He has presented us with a brief itinerary and an annotated list of both collections. [In German.]

Miller, Alden H.—The Fossil Passerine Birds from the Pleistocene of Carpentiria, California. (*Univ. Calif. Publ., Bull. Dept. Geol.* Vol. 21, No. 7, pp. 169–194, pls. 12–14, Feb. 26, 1932.)—Bones of twenty-three species are described in detail and figured. Of these seventeen are identified specifically and three of the other generically. No new names are proposed.

Miller, James Nevin.—A Duck Census from the Air. (*American Forests*, April, 1932.)—Photographing duck flocks on the Potomac River from an airplane.

Oberholser, H. C.—Descriptions of a New Odontophorus from Costa Rica. (*Proc. Biol. Soc. Wash.*, Vol. 45, pp. 39–42, April 2, 1932.)—*Odontophorus smithianus* (p. 45), San Joaquin de Dota.

Oberholser, H. C.—The Birds of the Natuna Islands. (*Bull. 159*, U. S. Nat. Mus., 1932, pp. 1–137, price 25 cts.)—This important paper consists of an annotated list of the 127 species recorded from the islands, with a preliminary discussion of their distribution on the various individual islands and comparison with adjacent faunas.

The author's personal studies are based upon a collection made by Dr. W. L. Abbott in 1900 and presented to the U. S. National Museum, and all of his specimens are listed. There is also a list of the extralimital races of species which are divided subspecifically, with their respective ranges; also a map of the group. Twenty-two new races are described in this paper, while some others have been previously described by Dr. Oberholser.

Pirnie, Miles D.—Fall Migration of the Black Duck from Northern Michigan. (*Papers of the Michigan Acad. of Sci., Arts and Letters*, Vol. XV, 1931, pp. 485–490.)—A bird-banding study showing the place of recovery of 199 banded birds out of some 1000 banded. They were shot all down the Mississippi to the Gulf and on the Atlantic coast from Long Island to South Carolina.

Reh, L. et al.—Animal Depredations on Useful Plants. (*Vol. V. Handbuch der Pflazenkrankheiten* 1932.)—Birds pp. 753–846, discussed systematically by families with lists of plants which they damage. [In German.]

Riley, J. H.—A New Babbler from Northern Siam. (*Proc. Biol. Soc. Wash.*, Vol. 45, pp. 59–60, April 2, 1932.)—*Heteroxenicus nangka* (p. 59) Pang Meton, northern Siam.

Scoville, Samuel, Jr.—The Duck Hawk's Nest. (*The American Legion Monthly*, April, 1932.)—A popular account of the breeding of this falcon in New England.

Smalley, Fred. W.—Changes in the Distribution of British Geese. (*Scottish Naturalist*, No. 195, May–June, 1932.)

Sprunt, Alexander, Jr.—Visitors from Afar. (*Charleston Museum Quarterly*, Vol. II, No. 1, 1932.)—Discussion of migration of Lesser Scaup Ducks; returns from 316 banded at Combahee River, S. C., show that their route is northwestward toward Manitoba and Saskatchewan.

Sumner, F. B.—Genetic, Distributional, and Evolutionary Studies of the Distribution of Deer Mice (Peromyscus) (*Bibliographia Genetica*, IX, 1932, pp. 1–106.)—While dealing with mammals this paper has a direct and important bearing upon the nature of subspecies and the permanency of their characters. The claims of Lowe and Mackworth-Praed, already discussed in these columns, that subspecies in birds are unstable, environmental modifications which would quickly disappear in a new environment, are shown by Dr. Sumner to be without foundation so far as Peromyscus is concerned, the races maintaining their distinctive differences of form and color when reared for many generations in a common environment.

Taverner, P. A.—A New Subspecies of Willow Ptarmigan and a New Hybrid Grouse. (*Ann. Rept. Nat. Mus. Canada*, 1930, pp. 87–89 with one plate.)—*Lagopus lagopus leucopterus* (p. 87) west coast of Baffin Island. *Lagopus lagopus* × *Canachites canadensis*, (p. 89).

Todd, W. E. Clyde.—New South American Wrens. (*Proc. Biol. Soc. Wash.*, Vol. 45, pp. 9–14, April 2, 1932.)—*Pheugopedius rutilus interior* (p. 9), Santander, Colombia; *P. r. intensus* (p. 10), Azulita, Venezuela; *Henicorhina leucophrys boliviana* (p. 10) Dept. Cochabamba, Bolivia; *H. l. meridana* (p. 11), Merida, Venezuela; *Leucolepis modulator rutilans* (p. 12), Rio Solimoes, Brazil; *L. m. transfluvialis* (p. 13), Rio Solimoes, Brazil; *L. m. interpositus* (p. 13), Villa Braga, Brazil.

Wetmore, Alexander.—The Pleistocene Avifauna of Florida. (*Proc. VII International Ornith. Congress*, 1930.)—Apparently a résumé of his paper on the same subject in Smiths. Misc. Coll. Vol. 85.

The Ornithological Journals.

Bird-Lore. XXXIV, No. 2. March–April, 1932.

Cock o' the Wood. By Frederick R. Flickinger and L. D. Hiett.—An interesting account of a Woodcock's nest and the hatching of the young, with photographs.

Crow-Traits. By W. McL. Orford.—Destroying eggs and young of other birds and a "crow trial" where an individual is singled out for attack by the others.

Why Not Have a Bird-Bath? By Julia F. Lenhart.

Tests to Determine Quality of Binoculars. By Elsa Reichert.

The Ani is figured in the frontispiece with notes on plumage and migration.

An excellent life history of the Killdeer is presented by Dr. A. A. Allen, with numerous illustrations.

An illuminating report of agents of the National Association of Audubon Societies on the killing of hawks at Cape May Point is presented, based upon a month's field work by Mr. Geo. B. Saunders. From many years experience with this matter we are inclined to think that, as Mr. Saunders says, this season was a poor one for hawks, furthermore we learn that his presence, which was heralded and bitterly resented by the local press, deterred the worst offenders from shooting during his stay. Usually Marsh Hawks are killed in numbers, while Italian residents use nets, and we have picked up in a single heap near a gunner's stand, Barn Owls, Ospreys, Nighthawks and Whip-poor-wills; while we have found gunners plucking their birds in the woods to render identification difficult.

Bird-Lore. XXXIV, No. 3. May–June, 1932.

Bird-Photography on the Salt Marshes. By John Bartram.—Excellent photographs of Osprey, Clapper Rail, Laughing Gull and herons, at Stone Harbor, N. J.

The Silver Flight: An Idyl of the Mourning Dove. By Mabel Osgood Wright.—Describing the nuptial flight. An account of a captive dove by Dr. Bergtold follows.

A Flycatcher History. By Milton Goff.—Alder Flycatcher at Rockford, Ill.

With Kirtland's Warbler Among the Jack-Pines. By Lawrence H. Walkinshaw.—In Crawford Co., Mich.

The American Redstart is the subject of Dr. A. A. Allen's illustrated life history, while there is a frontispiece of the Dipper.

Perhaps the most important item in this number is the correspondence between Dr. T. Gilbert Pearson, president of the National Association of Audubon Societies and Mr. Paul G. Redington, Chief of the Biological Survey on the poison question (See p. 394, beyond.)

The Condor. XXXIV, No. 2. March–April, 1932.

Are Rings of Holes in Tree Bark Made by Downy Woodpeckers? By Charles W. Townsend.—Concludes that they are made by the Sapsucker (*Sphyrapicus*).

Observations on the Head-markings of the Golden-crowned Sparrow. By Joseph Mailliard.—Finds that birds banded two years previously as immatures still retain the dull head coloration and concludes that it takes at least three years to acquire the full plumage. Similar results have been obtained, we believe, in the banding of White-throated Sparrows.

Nesting of the Hammond Flycatcher in Eldorado County, California. By Rose Carolyn Ray.

Technique of Raptor Food Habits Study. By Paul L. Errington.—Argues for qualitative as well as quantitative data. Gullet examination and pellet examination are discussed at length and the plan of tethering young hawks after they could fly, where the parents would continue to feed them, so that continued gullet examination could be continued, is suggested.

The Two Check-Lists of 1931—A Critical Commentary. By Joseph Grinnell.—Reviews of the A. O. U. 'Check-List' and Peters' 'Check-List of Birds of the World.' With regard to the former the present writer has already discussed many points raised by Dr. Grinnell (cf. Auk 1931, pp. 523) but he would call attention to the practice among those who have reviewed the 'Check-List,' and Dr. Grinnell is no exception, of blaming the 'Fourth Edition' for "faults" which were really contained in the 'Third'! The use of a single "i" throughout, in genitive personal names, is a case in point which was continued from the previous edition, especially in view of the general expectation that it would be adopted by the International Commission at the Padua Meeting. Another point of criticism, which was also carried over from the third edition, is the failure to give reference to a specific name when the so-called typical subspecies does not occur within our range (as *Xanthura luxuosa glaucescens* cited by Dr. Grinnell). All these matters were decided by a majority vote of the Committee and

except where a change was voted the editor was instructed to follow the treatment of the last edition. In the forming of vernacular names we have a matter entirely of personal opinion and we still doubt whether the majority of bird students would prefer "Marin Chestnut-backed Chickadee" to "Nicasio Chickadee"! Dr. Grinnell implies that the former was changed to the latter which is not the case. The bird stood in the former edition as "California Chickadee" which seemed so misleading in view of the other California races that a change was thought necessary. In some other cases the editor had to make a change on his own initiative; he was instructed to add a distinctive term in cases where it was necessary in order to balance other names in the same group, i. e., we formerly had "Bush-Tit," "California Bush-Tit," etc.; a qualifying term was obviously needed in the former and "Coast Bush-Tit" was used. There are some matters in which consistency seems impossible and this question of names for subspecies is one. Let the critics try it out! Of course Dr. Grinnell has always demanded consistency and has formulated a series of sesquipedalian vernacular names for California birds and ignored the nomenclature of the 'Check-List.' This practice, if generally followed, as we have frequently claimed, will throw nomenclature into chaos. We quite agree with Dr. Grinnell that the abolishing of the Committee and the appointment of a single author would render the compilation of a check-list easier, but would the result meet with any more general approval and would it have as much weight? We recall the strenuous resentment when it was supposed in certain quarters that the present 'Check-List' was to be prepared in that way! Furthermore it is not always easy to find someone willing to give the necessary time to, and assume sole responsibility for, the job!!

The Condor. XXXIV, No. 3. May–June, 1932.

Breeding Range of the Yolla Bolly Fox Sparrow. By Harold W. Clark.

A New Species of Cormorant from Pleistocene Deposits near Santa Barbara, California. By Hildegarde Howard.—*Phalacrocorax rogersi* (p. 118).

Further Facts Concerning Losses to Wild Animal Life through Pest Control in California. By Jean M. Linsdale.—This array of facts should prove food for thought for all interested in wild life preservation as well as those whose object is the control of noxious species. The agitation of this question has apparently resulted in much more care in the use of poison. We still hope that Congress and the U. S. Department of Agriculture will see their way clear to leave poison campaigns wholly to the states which are concerned in the matter and relieve the Biological Survey from criticism that will eventually seriously affect its legitimate operations. (See also Bird-Lore p. 235 and p. 394 below.)

The Wilson Bulletin. XLIV, No. 1. March, 1932.

Nesting of the Bald Eagle. By A. F. Ganier.—In Mississippi and Tennessee.

The Influence of Temperature on Migration. By John S. Main.—An unusually mild winter did not induce earlier migration.

A Winter Robin Roost in Arkansas. By J. D. Black.

Curvature of Wing and Soaring Flight. By W. B. Taber, Jr.—Another contribution to the much discussed problem of the soaring bird.

Charles W. and Titian R. Peale and the Ornithological Section of the Philadelphia Museum. By Frank L. Burns.—Much interesting historical matter with extracts from manuscript catalogues of the specimens—one in the Historical Society of Pennsylvania; location of the other, covering donations 1803–37, apparently not mentioned.

Bulletin of the Essex County (Mass.) Ornithological Club. No. 13. December, 1931.

Great Black-backed Gull Breeding in Essex Co., Mass. By W. G. Means and R. J. Eaton.

Ipswich River Bird Trip. By Ralph Lawson.—108 species seen May 16–17.

The Shooting Season of 1931 in Essex County. By Edward Babson.

A List of the Birds of Essex County, Massachusetts. By A. P. Stubbs and S. G. Emilio.—An annotated list of 336 species and subspecies plus 29 in a hypothetical list. The nomenclature of the new A. O. U. 'Check-List' is followed but when a difference of opinion on nomenclature has been expressed the fact is noted in a footnote, an excellent plan, although it has not been followed in the case of the Snow Geese which the authors list as distinct species. Why this one case should be picked out as an exception is hard to understand.

Other local notes and short papers complete this excellent publication.

Bird-Banding. III, No. 2. April, 1932.

Notes on the Breeding of the Tree Swallow. By O. L. Austin, Jr. and S. H. Low.—A careful statistical study of many nests on Cape Cod, Mass.

The Song Sparrow Breeding Season of 1931. By Margaret M. Nice.

The Austin Ornithological Research Station. By Oliver L. Austin.—In 1930, 3001 birds were banded representing 87 species; in 1931, 13,600 individuals and 112 species.

Report on Tern Banding on Cape Cod. By Charles B. Floyd.—5880 banded in 1931.

The Oölogist. XLIX, Nos. 537, 538 and 539. February to April, 1932.

Contains a number of short articles and notes on birds' eggs.—One severely criticizes the New Jersey State Museum Report of twenty-five years ago for lack of data on breeding of birds in northern New Jersey, and the importance of local lists. This latter claim we heartily endorse; it was the lack of published information for large areas in the northern counties that made this and many other of the earlier state bird books incomplete.

The Migrant. III, No. 1. March, 1932.

The Passing of the Passenger Pigeon. By H. P. Ijams.—A general compiled account.

Articles on the Red-tailed and Red-shouldered Hawks in Tennessee, Tennessee Christmas Lists for 1931 and many local notes on Tennessee birds complete this well printed little journal dealing with Tennessee ornithology.

Iowa Bird Life. II, No. 1. March, 1932.

Organ of the Iowa Ornithologists' Union, with the history of which and personal notes this issue is mainly concerned.

The Gull. XIV, No. 1–4. January to April, 1932.

Organ of the Audubon Society of the Pacific. Contains many notes on California bird life and field trip lists. Accounts of Saw-whet Owl (Jan.), Yosemite Christmas List (March), Wilson's Snipe (April).

Aviculture. IV, Nos. 2 to 5. February to May, 1932.

This excellent magazine of the Avicultural Society of America is replete with information on aviaries and cage birds with colored plates from Jean Delacour's works and from original paintings by Karl Plath.

An account of California Quail × Bob-white hybrids (March and May).

Trumpeter Swans in Wyoming and South Dakota (April).

We note an article headed "Rosette" Cockatoo meaning "Roseate." This erroneous spelling used to be common in oölogical journals in the case of the Roseate Spoonbill.

The Raven (Virginia); **The Flicker** (Minnesota) and **The Upland Plover** (Lancaster Co., Penna.), all mimeographed journals, contain many local notes for the regions covered.

The Ibis (13 ser.) II, No. 2. April, 1932.

Account of the Birds Collected by Mr. G. L. Bates in Sierra Leone and French Guinea, etc. By David A. Bannerman (concluded).

Further Notes on the Birds of the Balearic Isles. By P. W. Munn.

Some Breeding Habits of the European Nightjar. By David L. Lack.—A very complete account of nesting and behavior, well worthy of study by American ornithologists in connection with the Whip-poor-will.

On the Birds Collected in Madagascar by the Franco-Anglo-American Expedition. By J. Delacour.

Notes on Chaplin's Barbet (*Lybius chaplini*). By C. R. S. Pitman.—Rediscovered on the Nansenga River, North Rhodesia.

We note an increasing tendency in 'The Ibis,' especially marked in this issue, to drop all authorities from the scientific names. This may be excusable in local lists where there are standard check-lists to which reference may be made, but it is often very annoying in lists of foreign species.

Christian Ludwig Brehm. By Hugo Hildebrandt.—An interesting biography with portrait.

The Birds of South-West Transbaikalia, Northern Mongolia, and Central Gobi. By E. V. Kozlova.—(Abridged translation from the Russian publication.)

British Birds. XXV, No. 9. February, 1932.

The Hunting of the Sparrow Hawk. By J. H. Owen.—Method of hunting which corresponds to its close relative our Sharp-shinned Hawk and like it the English Sparrow Hawk "is shot down on sight whenever opportunity offers."

The Fledgling Period of the Barn Owl. By W. Wilson.—With excellent photograph.

Movements of Ringed Birds. By H. F. Witherby.—A bird-banding study showing by maps the winter quarters of birds banded in England as nestlings and the source of winter resident birds that come to England. An important paper, continued from earlier numbers. See also No. 12 for supplement.

British Birds. XXV, No. 10. March, 1932.

Notes on the Tree Sparrow. By A. W. Boyd.

Notes on the Corn Bunting. By John Walpole-Bond.—Both important life histories.

Report on the "British Birds" Marking Scheme. By H. F. Witherby (continued in April).

British Birds. XXV, No. 11. April, 1932.

Incubation-Periods of Lesser and Great Black-backed Gulls and Herring Gulls. By R. M. Lockley.

Starling Roosts and Flight Lines near Oxford. By J. Marples.

British Birds. XXV, No. 12. May, 1932.

Ornithological Report for Norfolk for 1931. By B. B. Rivère.

The Oologists' Record. XII, No. 1.

Observations on the Wood Lark. By D. Nethersole-Thompson.

Breeding of the East African Lesser Button Quail (*Turnix nana luciana*). By H. F. Stoneham.

Notes on Breeding Habits and Eggs of the Bronze-wing Courser (*Rhinoptilus chalcopterus*). By C. R. S. Pitman.

The Avicultural Magazine. X, Nos. 2 to 5. February to May, 1932.

Each number contains much interesting information regarding aviaries and foreign birds in captivity. There are colored plates of the Gouldian and Painted Weaver Finches and two parakeets (*Neophema splendida* and *Neonannodes chrysostomus*).

Bird Notes and News. XV, No. 1. Spring, 1932.

Organ of the Royal Society for the Protection of Birds. Contains numerous reports, etc. on bird protection; an article on Canadian Song Birds and the prize school essay on birds—"Barn Owl and Buzzard," by G. B. Blaker (Eton).

The Emu. XXXI, Part 4. April, 1932.

Some Notes on the Little Kingfisher. By R. S. Miller.—Colored plate from painting by Cayley.

A List of the Birds of Maysfield, Victoria. By A. E. Bridgewater.

Notes on the Australian Forms of the Genus Zosterops. By Geo. Mack.

Also numerous articles on the nesting of various Australian birds.

The South Australian Ornithologist. XI, Parts 5 and 6. January and April, 1932.

Heat in the Interior of South Australia.—Temperature of from 116° to 120° F. for sixteen consecutive days caused the death of thousands of birds of all sorts. They gathered under standing railroad coaches and in any sort of shade and where they could reach water plunged in apparently stunned by the heat and drowned. On one dam 60,000 Shell Parrots were found dead and the water in some wells was covered by a thick mass of decaying birds. (April issue.)

The Bateleur. III, No. 4. October, 1931.

Turnix nana luciana (p. 79) is described by H. F. Stoneham from Kenya Colony.

The List of birds of the Trans-Nzoia District of Kenya Colony is continued.

Alauda. II, No. 4. December, 1931. [In French.]

France and the Passage of Danish Migrants. By P. Skovgaard.—A bird banding study with maps showing recoveries of banded birds.

Notes on the Falcons of Siberia. By G. Démentieff.

Ornithological Observations in Roussillon. By N. Mayaud.—An extended annotated list.

Three Articles on the Gray Tits. By H. Jouard.—Critical discussion.

Numerous notes on French Birds.

L'Oiseau. II, No. 2. 1932. [In French.]

Notes on Philippine Birds. By M. Hachisuka.

The Franco-Anglo-American Expedition to Madagascar. By A. L. Rand.—With maps and itinerary.

Limnodromus semipalmatus Blyth in Western Siberia. By V. Hachlow.

Birds of the Camargue. By W. E. Glegg (concluded).

On the Biology of the Rook. By J. Dalmon.

Notes on French birds and on aviaries.

Le Gerfaut. XXI, Fasc. 3 and 4. 1931.

Notes on Belgian birds including a study of Belgian Cormorant rookeries.

Journal für Ornithologie. LXXX, Heft 2. April, 1932. [In German.]

Physiological-anatomical Researches on the Posterior Limb of the Bird. By Max Stolpe.—A detailed paper discussing structure, locomotion, and variations in the various avian groups.

Field Characters of the Tringae. By H. Frieling.

On the Breeding Biology of the Sparrow Hawk (*Accipiter nisus*). By O. Schnurre.

Observations on the Method of Feeding and the Length of Submergence in Young Crested Grebes. By F. Groebbels.

Ornithologische Monatsberichte. Vol. 40, No. 2. March, 1932. [In German.]

A Wonderful Migration of Birds of Prey on the Bosphorus. By Otto Steinfatt.—On October 1, 1931, 1587 birds were noted passing, nearly all Hawks and Eagles and Black Storks.

The Display of *Parotia sefilata*. By W. Johnas.—In the collection of Paradise Birds in the Berlin Zoo., illustrated.

New Subspecies from Siberia and Manchuria. By W. Meise.—*Cyanopica cyanus stegmanni* (p. 43) Charbin, Manchuria; *Emberiza spodocephala oligoxantha* (p. 43) Ssalair, W. Siberia; *Eremophila alpestris hachlowi* (44) Tarbagatai; *E. a. altaica* (p. 44) Altai.

Preliminary Report on the Results of the Heinrich Expedition. By E. Stresemann.—*Myzomela chloroptera charlottae* (p. 45) and *Phyllergates cucullatus hedymeles* (p. 46) from Celebes.

In 'Short Notes' Stegman describes *Calandrella minor pseudobaetica* (p. 54) from Kurdistan, and Stresemann, *Passer montanus kansuensis* (p. 55) from North Kansu.

Ornithologische Monatsberichte. Vol. 40, No. 3. May, 1932. [In German.]

The Bird Collection of the Tring Museum—Its Development and its End. By E. Stresemann.—An account of the beginning and building up of this notable collection, now purchased by the American Museum of Natural History and transported to America.

On the Cuticle of Birds' Eggs. By M. Schönwetter.

Stresemann describes *Hieraaetus fasciatus renschi* (p. 78) from Sumbawa and *Meise Rhinomyias colonus subsolanus* (p. 80) from Celebes, a new genus for the Island.

On the Breeding of the Black Stork in South Africa. By H. Grote.

OBITUARIES.

The death of Dr. Charles W. Richmond, Fellow and Councillor of the American Ornithologists' Union, on May 17, 1932, leaves a gap in the ranks of American ornithologists that will not soon be filled. Aside from his intimate acquaintance with the birds of all parts of the world he possessed a knowledge of the technical literature of ornithology equalled by few if any ornithologists either in this country or abroad. The wonderful card catalogue of bird names in the bird room of the U. S. National Museum, where he spent the greater part of his life in charge of the collections, will ever be a monument to his knowledge and industry.

There have been few bird students in recent years who have not sought his aid in nomenclatural problems and few explorers who have not come to him for information about the bird life of the particular country which they were to visit. And of his store of knowledge he gave freely without thought of return, while his modesty prevented his friends from bestowing upon him positions of honor which they were anxious to tender.

To the younger bird students he exhibited the same kindly and helpful interest that his predecessor as Curator of Birds, Robert Ridgway, had shown to him and others of his generation, and, ever full of admiration for Ridgway, he endeavored, with entire success, to maintain the same delightful atmosphere in the Department of Birds in the new Museum that the latter had established in the old Smithsonian Gallery.

Those who looked forward to meeting with Richmond at the annual gatherings of the A. O. U. and who enjoyed his cheerful disposition, his illuminating conversation, and his quiet humor, will sadly miss his presence; his associates at the Museum who had acquired a love and respect for him that his personal character was bound to develop, will feel his loss still more acutely; while to the visiting ornithologists accustomed to gather around his desk to discuss their problems and activities, the Department of Birds will never be quite the same.

The president of the Union will appoint a biographer to prepare a memorial for publication in an early number of 'The Auk.'—W. S.

Charles Livingston Bull, associate member of the American Ornithologists' Union since 1920, died at his home in Oradell, N. J., March 22, 1932. He was born near Livonia, Livingston County, N. Y., on May 25, 1874 and his early years were spent in and near Rochester, N. Y. My earliest recollection of Mr. Bull was about 1890, when we were young chaps, residents of Rochester and members of the now long defunct Western New York Naturalists' Association.

Bull studied in the art school of Miss Louise Stowell and Harvey Ellis,

and became a great admirer of Japanese art. He remained in Rochester until about 1900, studying taxidermy at Ward's Natural Science Establishment, where he succeeded Dr. William T. Hornaday as taxidermist. From there he went to the National Museum in Washington and here again, succeeded Dr. Hornaday as taxidermist. There, too, he came in contact with such men as Charles R. Knight, Louis Agassiz Fuertes, and other ranking naturalists and artists.

He spent much time at the National Zoological Park, sketching birds and animals. On a trip to New York in 1902 he took a number of these pictures with him and 'Frank Leslie's Magazine' endeavored to secure his exclusive services. The offer was refused, but Mr. Bull found ready sale for his wild life pictures wherever he went. He took up his abode in the Bronx, near the New York Zoological Park, where he resumed his daily sketching of animals and birds. He and William Beebe, then curator of birds at the Zoo became warm friends and made a trip to Mexico together.

In 1907 Mr. and Mrs. Bull went to British Guiana, from which country they brought back many sketches of wild life. With Charles R. Knight he made a trip to Bermuda, where many pictures of marine life resulted. Trips to New Orleans, Glacier Park, Charleston, S. C., Florida, and Canada all gave him great joy. "He saw every bird that came within his line of vision and was always enthusiastic and anxious to see the next."

"He much preferred watching the wild creatures alive than dead, so he didn't often use a gun.—He was always looking for the beauty of the beautiful and I have heard many say that it was this trait that made him so delightful a companion in the field.—He was gentleness and kindness itself and the most unselfish of men.—He was so eager to see the first robin this spring, just before he died and watched from the window daily. I am glad to say he saw one, but not long after he passed from our sight. His work here was ended but the memory of him will never fade and in one sense of the word he will be here always."

At his Oradell home in recent years Mr. Bull took an active part in the Boy Scout work and served for some time as master of a troup. One of the finest things that ever goes into scouting, nature study, was insured in full measure to this troup. Up to the time of his final illness he was conducting an active bird banding station at his home.

Mr. Bull's death followed an illness resulting from an injury to his back sustained several years ago. He is survived by a widow, Mrs. Fanny E. Bull.

Despite the place that he made for himself as a naturalist and taxidermist, he was undoubtedly much better known as an outstanding animal artist and a generally lovable character and as such he will be remembered by hosts of friends and admirers.—B. S. B.

NOTES AND NEWS.

We have again to thank several authors of papers who have paid in whole or in part for the publication of their papers and thus helped us to "balance a budget" without seriously reducing the size of 'The Auk', but it has been necessary to cut down the space devoted both to "General Notes" and "Recent Literature." In the former we have published only such notes as reached us prior to May 20 (instead of June 1 as usual) and in the latter to review in detail only some of the larger or more important books and papers treating the others under "Shorter Papers." We trust that we may be able to bring "General Notes" up to date in the October issue and that authors of some of the papers will understand the reason for the abbreviated reviews.

In the May–June issue of 'Bird-Lore' we find an illuminating correspondence between Dr. T. Gilbert Pearson, President of the National Association of Audubon Societies and Mr. Paul G. Reddington, Chief of the Biological Survey, and the reaction of the former to the poison policy of the Survey. In this Dr. Pearson states that Congress directs the Department of Agriculture, through the Biological Survey, to engage in control measures but the Survey adopts its own methods in carrying out the general instructions and it is clearly within its jurisdiction to determine whether poison shall be used. He says: "From Mr. Reddington's letter we find with extreme regret that our appeals and those of others have had little effect on the Survey regarding poisoning operations. His statement that the Survey 'will continue to use poisons' shows that it is committed to a policy almost universally condemned by conservationists."

It appears from Dr. Pearson's statement that the Biological Survey appropriation passed by the House for 1933 allocates $829,697 for conservation and $573,780 for "control"; a reduction of over $400,000 in the former item and only $17,000 in the latter, from the 1932 appropriation; which is pretty clear evidence of Congress's idea that the province of the Survey is not primarily the *preservation* of wild life.

Dr. Pearson concludes: "While we appreciate the incalculable contributions of the Biological Survey to many phases of conservation, in this particular instance we are squarely opposed to its policy and shall use such means as are at our disposal to combat this practice. We call upon the people of the country, especially those residing in the Western States to unite their influence with ours in seeking to induce Federal, State, and local agencies to discontinue the general use of poisons in pest-control measures. Also we shall urge that appropriations for any such work shall be made only with the stipulated understanding that no part of such funds shall be used in the purchase or distribution of poisons." The "means" at Dr. Pearson's disposal are very considerable and by provoking the opposi-

tion of the National Association, in addition to that of the American Society of Mammalogists and other conservation organizations the Survey would appear to be placing itself in a most unfortunate position. A resolution protesting against the use of poison in control work was, we understand, presented at the last meeting of the American Ornithologists' Union and referred to the Committee on Bird Protection which will be expected to present a report for action at the meeting in October.

THE purchase of the famous Tring collection of birds for the American Museum of Natural History has already been noticed in the public press[1] and at our request Dr. Robert Cushman Murphy, who took care of the cataloguing and shipment, has prepared the following account of the collection for 'The Auk.' As Dr. Murphy says, while American ornithologists will welcome the acquisition of this collection, they cannot but sympathize with their co-workers in England on conditions which made its sale necessary.

In October, 1931, Lord Rothschild wrote Dr. Leonard C. Sanford, a trustee of the American Museum of Natural History, saying that he had reluctantly determined to offer for sale the greater part of his renowned collection of birds. Through the generosity of a patron, ownership of this great ornithological treasure was formally transferred to the American Museum on February 13, 1932.

The agreement called for the delivery of all birds belonging to Lord Rothschild with the exception of the mounted collection on exhibition in the public halls of his museum, the series of struthious or ostrich-like birds, and a small number of duplicate specimens, representing various families, which Lord Rothschild wished to retain chiefly because the species were not otherwise represented in Great Britain.

No general catalogue of the Tring Collection had ever been prepared, and the exact number of specimens destined for the American Museum was unknown until a four months' task of inspection and listing was completed, in May, when the total proved to be slightly under 280,000. Shipment of the material to New York was made in six consignments, the last of 185 wooden cases reaching the American Museum early in June. Unpacking will not be begun until the Whitney Memorial wing of the Museum, the new home of the Department of Birds, is finished and equipped for arrangement and storage of the specimens.

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[1] Recent articles relating to the Tring Collection, and to its transfer to New York, are the following:

Hartert, Ernst, 1931, Das Tringmuseum und seine Entwickelung. Journal für Ornithologie, LXXX, pp. 140–143.

Anonymous, 1932. A Great Bird Collection for America. The Field, Mar. 26, p. 445.

Stresemann, E., 1932. Die Vogelsammlung des Tring-Museums, ihr Aufbau und ihr Ende. Ornithologische Monatsberichte, May, pp. 65–73.

Witherby, H. F., 1932. The Tring Collection of Birds. British Birds, XXVI, pp. 17–21.

The development of the Zoological Museum at Tring during a single lifetime is a great monument to the zeal and munificence of Lord Rothschild, and to the wisdom with which he chose his collaborators. Construction of the present group of buildings was begun about 1890, many distinguished British scientific men contributing their counsel as to the plan and aim of the institution. In 1892 Dr. Ernst Hartert was appointed Director, a post from which he has only recently retired, and in 1893 Dr. Karl Jordan became head of the department of insects, which, like that of birds, has grown to be one of the most important centers of activity in taxonomic and biological science.

Of the entomological division, and of the collections and publications relating to reptiles, mammals and other vertebrates, we need not speak here. A good proportion of Lord Rothschild's many-sided interest in natural history has always been devoted to ornithology and, in team work with Dr. Hartert, he has built up the amazingly rich and useful collection of birds which has finally passed to the American Museum.

During the first period of rapid growth, the Tring Museum was enlarged by the acquisition of important private collections, particularly such as had been fully studied and reported upon. Buller's New Zealand birds, the Galapagos collections of Baur, the Emin Pasha African collection, and the famous Brehm collection, which includes 371 types, mostly of European birds, are examples of many such additions. The policy has indeed been maintained up to the present date, as witnessed by the recent purchase of approximately 50,000 Australian specimens which had formed the basis for the monograph by Mathews. These facts, together with the speed with which new material has always been studied in Tring, and as promptly reported upon in Lord Rothschild's scientific journal, 'Novitates Zoologicae,' are among the reasons why the collection is so valuable to students. It is the most-studied of all bird collections, and a list of those who have pursued researches at Tring would be in large measure a roster of the foremost ornithologists of our time. The collection may be said to represent the substance of an ornithological library because it is so rich in types and historic examples upon which discussions have been based and important conclusions reached.

Lord Rothschild has always had a deep interest in rare and disappearing creatures, and he has shown keen foresight in acquiring material from islands and other regions in which modern changes were likely to bring about extinction. This explains the presence in the Tring collection of the irreplaceable series of birds from the Galapagos, Hawaii, etc. Equally important among his ideals was the systematic exploration of ornithologically little known countries, such as Formosa, Hainan, the Papuan region, and many parts of Africa. It would, however, be misleading to cite even large numbers of such scattered localities, for above all else, Tring has built up a World Collection in the fullest sense. Dr. Hartert was naturally interested in perfecting the representation of birds of the Palaearctic region, a goal which has been approached more closely than

by any other institution. He and Lord Rothschild made a number of highly profitable journeys to different areas in North Africa, and by field work, purchase, and exchange a vast collection, covering all of the northern part of the Old World, was eventually brought together.

The manner in which the Tring material supplements the former collection of the American Museum is most remarkable. We already had an excellent representation of North and South American birds, of the fauna of forested Africa (i. e., the Congo basin), of Polynesia and of certain other islands and oceanic areas. Through acquisition of the Tring collection we add the birds of Europe, Asia and North Africa, those of East and South Africa, the Indo-Malayan and Melanesian districts, Australia and New Zealand, together with a large proportion of extinct or nearly extinct species from many localities, not to mention the very valuable hybrids and aberrant forms of many families, in which Lord Rothschild has always taken a special interest.

The Tring Collection contains several genera of birds not, up to the present, represented in the American Museum; it contains also a relative wealth of species known from unique specimens. Type specimens number in the neighborhood of three thousand. The total number of genera, as listed in the recent manuscript catalogue, run to about twenty-five hundred but, since Dr. Hartert has always given generic names a very comprehensive application, the actual representation of genera, as they are described and used in ornithological literature, is very much larger.

Aside from the rarities and historic specimens, which have a special appeal, the greatest resource which the Tring Collection offers to ornithology in America lies probably in the satisfying series of entire Old World families and lesser groups. It will now be possible for the student to examine nearly all the known forms of parrots, rails, birds of paradise, sunbirds, babblers, and many other aggregations, without crossing the Atlantic. Likewise, it will become peculiarly illuminating, even to the best informed ornithologists, to be able to compare their series of familiar North American races with the representative Palaearctic forms in equally adequate series. It imparts a new meaning to the subjects of evolution and geographic distribution to see upon one table the evidence that our own very *species* of nuthatches, horned larks, titmice, finches, etc., occur also in parts of Europe and Asia, in the north African deserts, or upon Mediterranean islands.

It must not be forgotten that as we in America have gained, so European ornithologists have lost the ready use of an important tool of their craft. The hospitality and liberality of Tring have become proverbial. It is the hope of the American Museum of Natural History that the effect of this deprivation may be ameliorated in so far as possible. Not only are facilities in preparation for guest-workers but, moreover, every effort will be made to further the investigations of such as must continue the bulk of their labors at home.—R. C. M.

THE Tenth Annual Meeting of the Baird Ornithological Club was held on the evening of March 23, 1932, at the home of Henry C. Fuller, Chevy Chase, D. C., with President E. R. Kalmbach in the Chair and twelve other members present.

Following a short address by the President, the Club elected the following officers for the ensuing fiscal year: President, Dr. T. S. Palmer; Vice President, Dr. Paul Bartsch; Secretary, Frederick C. Lincoln; Council, Dr. C. W. Richmond and A. H. Howell.

Mrs. Bradshaw H. Swales, widow of the founder, and first secretary (later president) of the Club, was elected to Honorary Membership, being the first lady to be accorded this distinction.—F. C. L.

THE 50th Stated Meeting of the American Ornithologists' Union will be held in Quebec, October 17–20, 1932. The Local Committee in Charge of Arrangements is preparing an exhibit of bird paintings and photographs in connection with the meeting to which all persons, whether members of the Union or not, are invited to contribute. Those who have original paintings or photographs suitable for exhibition are requested to communicate with the chairman, Mr. Reginald Meredith, 45 Dalhousie St., Quebec, in regard to details of the exhibit, and when shipping pictures should advise him as to the value to be placed on them for purposes of insurance. All exhibits should reach Quebec not later than the first week in October, should be addressed to the Provancher Society, Chateau Frontenac, Quebec, Que., and should be marked "A. O. U. Exhibit." The Local Committee will pay insurance on the pictures from the time they reach Quebec until they are returned to their owners and will also bear the cost of repacking and returning them.

Members who expect to contribute papers to the program should send the titles to the Secretary of the Union, 1939 Biltmore St., Washington, D. C., not later than *September* 15, and should submit with each title an abstract of not more than 200 words. More time than usual will be required for printing the program this year and it is important that all material should be in the hands of the Committee well in advance of the meeting.—T. S. P.

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